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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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German Exporters and the Levy

As already announced in THE CHEMICAL AGE, the German Government has definitely undertaken to co-operate in carrying out the intentions of the Reparation Act in two respects. First of all, it undertakes to recoup the German exporter to the extent of the 26 per cent. levy to be paid by British importers on all German goods imported direct into the United Kingdom. Secondly, it undertakes to levy a tax of 26 per cent. and to pay the equivalent of this sum to the British Government on all exports from Germany to neutral countries, with a view presumably to equalising the prices of German goods whether imported direct or through a neutral country. Some provision for securing the latter end seems necessary, for in the case of imports sent direct to this country the British importer has to pay 26 per cent. to the Customs, while in the case of German goods sold and delivered to a firm in a neutral country and thence exported to the United Kingdom the importer pays no tax.

Under the new agreement between the British and German Governments, the German exporter, being guaranteed a refund of the 26 per cent. deducted at this end for payment to the British Customs, should be content to receive a direct payment from the importer of the remaining 74 per cent. Originally he declined to accept anything less than the full value, with the result that trade with this country practically ceased. Now, we learn from a statement issued by the Chemical & Dyestuff Traders' Association, and from other sources, that there has been some modification of the original attitude. Some of the German concerns—the Badische Co., we believe, among them—have informed British firms that they will be content with 74 per cent. of the invoice value, looking to their own Government to reimburse them the remaining 26 per cent. Fuller information, however, shows that this attitude is by no means general. Many German firms still refuse to trade except on the basis of receiving the full invoice value of goods, on the ground that though reassuring statements have appeared in the German Press, no official announcements have yet been made by the German Government. How far the latter statement is true we are unable to say. It is obvious that the German Government could not communicate with every German exporter individually, and would have to rely upon statements issued through the Press for making its arrangements known to the public. The German business man, however, seems to have developed a spirit of suspicion, and though some firms are definitely prepared to accept 74 per cent. of the value, some little time must elapse before the practice becomes general. Representations, we understand, are being made to the Board of Trade and the Foreign Office and also to the German Embassy on behalf of traders in chemicals and dyestuffs as to the need of definite assurances being issued by the German Government on this point, so that both British and German traders may know exactly how they stand towards each other in commercial transactions.

The confusion of mind is not limited to the German side. It prevails among British traders in much the same way. The position may be simplified for chemical merchants who do business with Germany by remembering two guiding principles. The first is that the 26 per cent. levy is only payable to the British Customs on German goods directly imported from Germany into the United Kingdom. All goods exported from Germany to countries other than the United Kingdom are supposed to be taxed 26 per cent. before they leave German territory, and therefore no further tax is payable on them. Precisely how they will be so taxed before they leave Germany is a matter of domestic procedure for Germany itself, but as the German Government has undertaken to pay this country 26 per cent. of the value of all exports going elsewhere than to the United Kingdom, we may be sure the German Government will get it somehow out of the German people. The British importer, therefore, has no tax to pay when he imports German

goods from a neutral country; neither does he pay any levy on goods which may be despatched from Germany to his order to a customer in any other country except the United Kingdom. By degrees the reparation system is falling into shape, and if the terms of the agreement are kept by the German Government trade should presently become possible on regular lines.

Trade Problems

It is hoped that the coal strike is on the eve of settlement. The general opinion is that the great body of the miners will thankfully return to work, not merely because they need money, but because most of them are tired of an aimless leisure. That so large a stoppage of our real key industry should have continued so long without any disorder—with, in fact, scarcely any perceptible quickening of the public pulse—is a tribute to the sanity of the national character. Quiet and free from disturbance as the dispute has been, it has had a most depressing effect on industry at a time when all our energies are needed for the recovery of lost ground. This is evident from a glance at last month's trade returns. These show a decrease as compared with the month of April of £3,687,196 in imports, of £16,779,167 in exports, and of £1,292,826. The comparison of the latest returns with those for May of 1920 and 1913 is given below, and while showing a marked decline from last year, the figures look far less unsatisfactory when judged by those for the year before the war :—

	May, 1921.	May, 1920.	May, 1913.
	£	£	£
Imports	86,308,308	... 166,414,032	... 61,279,378
Exports	43,088,418	... 119,319,422	... 43,859,488
Re-exports.....	7,231,836	... 20,260,078	... 9,369,089

Taking the figures for chemicals, drugs, dyes, and colours, we find that the imports for the past month were £842,352, a decrease of £1,658,426 on those for 1920 and of £220,490 on those for 1913. This may be partly explained by the recent severe restrictions on free imports, under the Dyestuffs and Reparation Acts, and with a further extension of such restrictions under the Safeguarding of Industries Bill the decline may be expected to continue. In the exports of chemicals, drugs, dyes, and colours the decline is even more alarming. The figure for the past month is £1,080,417, a decrease of £2,382,597 on the May returns for 1920, and of £792,697 on those for 1913. The strike, of course, is the immediate explanation. But for this we might have been enjoying a quiet but steady recovery. There are, however, features which seem to justify the under-current of hopefulness which is still maintained. The conditions which produced the " slump " of last autumn have gradually disappeared. The mushroom type of speculator has had to sell out or go under, and stocks have diminished to a normal level, if not below. The way is clear, therefore, for a brisk advance when industry is freed from its present obstacles, and stagnant as the trade is the tone as to the early future continues quietly confident.

Apart from economic and industrial causes the situation is no doubt aggravated by restrictive legislation and regulations, our recent experience of which does not promise well for the future. Under the Reparation Act we hear of consignments of chemical goods being held up at ports for weeks, if not months, owing to the tangle of conditions which officials have to enforce. Traders may be excused for feeling some vexation when, after desperate efforts to keep trade moving, the goods they need for distribution to customers are kept idle at the docks, incurring additional wharfage or other charges. Business men are, perhaps, partly to blame for not organizing forces and bringing practical business considerations to bear on legislation and official regulations. The Post Office is often quoted as an excellent example of State control of industry; yet its accounts show a heavy deficit in spite of rising charges, constituting another very serious tax on business enterprise. There Mr. Kellaway has taken the wise course of appointing a representative commercial committee to advise on the conduct of the department. In the case of agriculture, which became a subsidised industry during the war, the Government has suddenly reversed its policy. Guaranteed prices are to be withdrawn, and with them the wages boards and State cultivation. There must, of course, be regulations of a general character over commercial relations, but the direct interference with industry, which has of late been practised so freely, has been distinguished by lack of knowledge, experience and responsibility. Business men are united on one point at least—it is time this official " tinkering " with business should cease.

The Chlorination of Methane

In the course of investigations carried out with the object of determining the more efficient utilisation of the fuel resources in the United States, the Bureau of Mines has undertaken a study of the production of useful products by the chlorination of natural gas. Many natural gas fields yield a gas which is free from the higher paraffins, propane, butane, and pentane, and which is, therefore, especially suitable for making chlorinated products. In the work covered only the so-called " dry gases " were investigated. The " wet gases " from wells located in isolated places are utilised at present for obtaining gasoline by treating them either by the compression or the absorption method. The " dry gases," consisting chiefly of methane and at times small proportions of ethane, are of no value for gasoline production. Accordingly, such gas offers possibilities for the production of methyl chloride, chloroform, and carbon tetrachloride. That chlorine will react with methane (the main constituent of natural gas) has for long been known, but there appears to be little definite knowledge in connexion with such conditions as the temperature effects of catalysts. Chlorine and methane will react to give a number of different products, such as methyl chloride, methylene chloride, chloroform, carbon tetrachloride, and free carbon, in each case with the formation of hydrochloric acid. For successful results a catalyst of such a nature is required that the desired substitution products will be given, and not merely free carbon and hydrochloric acid. Without a catalyser the reaction takes place rapidly and, being exothermic in character, usually causes an explosion with the result that practically no products are formed other than carbon

and hydrochloric acid. Many tests were made with different substances, especially coke impregnated with metals, to determine the relative effects of different catalysers in the production of methyl chloride. Those catalysers favouring the production of carbon tetrachloride obviously would not be expected to give large values when used for the production of methyl chloride, therefore more attention was paid to the effect of different metals and metal salts used as catalysers. The most favourable material for depositing the metals is that having a rather large surface area per unit of volume, and at the same time it must be inert as possible as a catalytic agent. Coke answered the requirements very well, and was used in nearly all the tests.

The results indicate that charcoals and specially treated coals are of no value as a catalyser for the production of methyl chloride. Of the many tests made, using coke impregnated with the different metals, the variations were not very marked. The best yields were obtained with tin on coke, nickel on coke, and lead on coke as the catalysers. In general, the Bureau of Mines results indicate that natural gas can be completely chlorinated at one operation, and that it is possible to obtain yields of 90 per cent., or even more, of chlorinated products; while, when gases containing ethane are employed, the tendency is for this gas to chlorinate in preference to the methane. A small amount of moisture in the gas tends to assist the reaction. As regards the commercial applications of the process methyl chloride, as is well known, is not very widely used outside the dye industry, because of the cost of production; but if it could be produced by any method of cheap manufacture, there should be a wide field for its use. Methyl chloride should make an excellent gas for refrigeration purposes, and has the advantage over sulphur dioxide and ammonia in that the gas is harmless in small quantities, and broken pipes could be easily repaired without great danger to the workmen undertaking the task. It can also be used in surgery as a freezing agent and as an anæsthetic. Patents have been granted for converting methyl chloride into methyl alcohol, while it offers possibilities for making toluol from benzol, using the Friedal-Craft reaction.

A Bad Case

REFERENCE is made elsewhere to cases of difficulty to importers arising out of the Reparation Act. One of the worst we have seen is described by the Hon. H. Onslow in a statement to the current issue of *Nature*. "I ordered," he states, "a case of chemicals from Germany for myself and other workers in the Biochemical Laboratory, Cambridge, on February 2. In order that these should not come under the Reparation Act, they were dispatched on March 24, and arrived on April 8. Although the Reparation Act did not come into force until April 15, the goods were seized at Grimsby, and after a week's delay I was asked for all the original documents showing that the goods were ordered before March 8 and delivered before April 15. These were at once sent to London, but no reply was received from the Customs until I was forced to request the Medical Research Council, for whose work the chemicals were required, to apply to the Customs to free the goods as soon as possible. After three weeks' delay I received a letter from the Customs saying that the original documents were insufficient, and that a statutory declaration was required to confirm the particulars and to prove that the contract had not been fulfilled. This necessitated two visits to a commissioner of oaths and the preparation of a lengthy manuscript document adorned with red seals, the cost of which I have still to discover. This evidence was forwarded to the Customs a fortnight ago, and I have received no answer. The goods are still at Grimsby, the work of several people is being delayed, and the goods will apparently remain impounded (although they never came under the Act) unless I am prepared to submit to what might almost be called blackmail. To obtain the chemicals I must pay the full 50 per cent. myself, the funds of the Medical Research Council being unavailable for the purpose, and I must trust to recover the money from the Customs when my claim has been recognised—evidently a very doubtful eventuality."

We suppose the writer means, by having to pay the full 50 per cent. himself, that he has been asked, as importers generally are, to sign a bond accepting liability for the duty in order to secure the release of the goods. This practice is very much objected to by traders, several of whom, in cases where they submit documents entitling them to release, decline to enter into such a contingent liability. The Customs point of view can, of course, be appreciated. The official reasoning is: "Here are heaps of cases waiting to be dealt with in rotation. It may take weeks to reach yours. You may be entitled to release, but we have no time to investigate the documents now. If, however, you will enter into a bond to pay what may be held to be due from you, you can have the goods. If nothing is due the bond will be cancelled; if something is held to be due we shall have your bond to pay it." It is a most admirable arrangement for safeguarding the Customs officials from worry and mistakes. The defect is that it ignores altogether the bad effect on trade, and the trouble to which it puts the trader. In a word, if the officials cannot get through the work, then trade must wait—unless the trader chooses to put his hand into the silken noose of a bond.

The Calendar

June.		
20–24	Annual Chemists' Exhibition...	Central Hall, Westminster, London.
21	Mineralogical Society: Papers by Professor H. Hilton; A. Brammall; A. Richardson. 5.30 p.m.	Natural History Museum, South Kensington, London.
22	Faraday Society: Ordinary Meeting: Scientific papers. 8 p.m.	Burlington House, Piccadilly, London.
23	Royal Society: Papers by E. F. Armstrong, T. P. Hilditch, and others.	Burlington House, Piccadilly, London.
29	Society of Chemical Industry: Nottingham Section.	Nottingham.

Books Received

TANNING MATERIALS. By Arthur Harvey. London: Crosby Lockwood & Son. Pp. 182. 15s. net.

PERFUMES, ESSENTIAL OILS AND FRUIT ESSENCES. By Geoffrey Martin. London: Crosby Lockwood & Son. Pp. 138. 12s. 6d. net.

Vitamins in Food Substances

The writer draws a comparison between the vitamin content of natural and manufactured food substances, and shows that the latter are likely to be deficient in nutritive properties.

THE importance of Vitamins in their role of accessory food factors is abundantly realised to-day. Research upon the many baffling problems in this field continues apace, and many previously conceived postulates are being controverted. Nevertheless, the question is charged with conflicting statements, and it is proposed to survey the matter in this article, setting forth only established points, as far as possible. The study of Vitamins is one which is of interest to all, especially in view of the part played by these substances in nutrition, and it must interest the technical chemist in particular in these days when " manufactured " foodstuffs are so common. It is certain that many food products consumed to-day contain relatively little vitamin, as compared with what may be termed " natural " foodstuffs. Many refined vegetable oils, lards and lard substitutes, margarines, dried fruits and vegetables, canned and preserved foods, and dried milk contain much less of the essential accessory food factor than do the materials from which they have been manufactured. If it be proved that sufficient vitamins are not taken in the ordinary general diet to allow of the consumption of foods containing little or no vitamins without harm or mal-nutrition, then new methods for the preparation of such foodstuffs will have to be sought, or means for adding artificially a vitamin " extract " to the manufactured vitamin-less product will have to be developed. It is only a matter of 12 years or so since the presence of vitamins in foodstuffs was suspected, but in the meantime a very large amount of pioneer work has been carried out in this country and abroad, and the subject is growing daily in interest and importance.

Deficiency Diseases

During investigations into the causes and treatment of " beri-beri," Funk came to the conclusion that a diet of *polished* rice was a strong contributory cause of the disease. Moreover, it could be prevented if the rice polishings, or an extract of the polishings, were added to the diet. Many investigations into the subject of deficiency diseases allowed of evidence being collected which pointed to the necessity for the presence in foodstuffs of some previously unknown factor. Only a very small amount of the so-called " vitamine " (the name " vitamin " being a recent improvement, since it is known that the accessory food factors are not basic or amine-like in constitution) was required in the diet to prevent mal-nutrition, scurvy, beri-beri, poly neuritis and deficiency diseases in general, provided, of course, that the diet was otherwise of the nature then held to be sufficient for the needs of the body. That is, the presence of a normal quantity of fats, proteins, carbohydrates, salts, &c., in a diet is insufficient unless the small necessary amount of vitamin be also present.

Later, there were found to be several accessory food substances, and these were designated " Fat soluble A," " Water soluble B," and " Water soluble C " vitamins. The behaviour of these three vitamins is essentially different, as will appear later, and their sources and occurrence vary. Fat soluble A vitamin is found in butter fat (and, therefore, of course, in milk), in cod liver oil, in green vegetables, and in the yolk of eggs, &c., It is, however, absent or almost absent from white bread, vegetable oils of many varieties, many lard and lard substitute products, and also from many margarines. Water soluble B, or the anti-neuritic vitamin, is contained in fresh green vegetables, the hulls of rice and other grain, and in yeast. It is not contained in polished rice, white bread, purified proteins and carbohydrates, nor in fats. Water soluble C, the anti-scorbutic vitamin, is found in milk, fresh vegetables (*e.g.*, swedes, turnips, tomatoes and especially cabbages), and in fruits, especially of the citrus family, whilst it is absent from white bread, fats, purified proteins and carbohydrates.

Besides occurring in different foodstuffs, the individual vitamins have special functions. Fat soluble A is essential for the proper growth of the human or animal body, whilst it is a preventive against rickets, xeropthalmia, &c. Water soluble B is essential for the prevention of beri-beri, boils, and skin eruptions. Water soluble C is necessary as a preventive against scurvy.

Many attempts have been made to isolate the vitamins in a pure condition, and claims have been made that this has been effected. There is as yet insufficient evidence to prove that anything approaching a pure substance has been isolated, and many products—the results of months of labour in extracting and purification—have been shown identical with well-known substances. It will be clear, therefore, that the difficulties attendant upon vitamin research are many. All tests for their evaluation (at present) must be physiological, and of long duration. The method of testing may be briefly indicated. Rats, guinea pigs, pigeons and other creatures are fed upon a diet from which vitamins are rigorously excluded. For a time, the animal lives, and may not show signs of mal-nutrition, since it is using its own vitamin reserves, stored up in its body. After a time, however, deficiency diseases set in, and at a suitable stage quantities of the extract to be tested are added to the vitamin-less food. Recovery takes place and growth again becomes possible, if the extract contains vitamins. By careful and studied improvements in technique, such a test can be made to furnish roughly comparative results, and allow a rough approximation of the amount of vitamin present in a new product to be made. A more definite test is needed, and experiments are being made in many quarters with this end in view. It has, for instance, been suggested that the growth of yeast in a solution containing vitamins can be made the basis of a quantitative test, but this is not yet substantiated. Yeast can develop in a non-vitamin containing medium, and it has been shown that yeast can synthesise vitamin for purposes of its own growth. (Macdonald and McCollum, *J. Biol. Chem.*, 1921, 45, 307.)

The above may serve as a passing example of the many attempts which are being made to find a chemical method for the evaluation of vitamins, and for their quantitative estimation in foodstuffs. At present, the feeding tests upon animals are the only means of obtaining even an approximate idea of the amount of vitamin in any food product, and each vitamin-containing substance has to be tested individually for its vitamin value.

Properties of Vitamins

The part played by vitamins present in foodstuffs in the well-being of the human and animal system has been referred to already. Some of the qualitative effects are thus well known, and so, indeed, are some of the properties of these substances of unknown constitution. Vitamins are neither salts nor proteins, and are not basic in character. They are soluble in water and alcohol, and are much more stable in weak acid solution than in alkaline media. Although, apparently colloidal in many respects, dialysis is possible. Vitamins are rich in nitrogen, but do not contain phosphorus. They are unstable in the presence of heat and (or) oxygen, and are selectively absorbed by means of Fuller's earth, especially that variety mined in Surrey. These latter

points are of special significance, and will be more fully treated in due course.

Many attempts have been made to isolate vitamins from natural products, but up to the present no success has been achieved. It has been found possible, however, to concentrate them, or to remove a very great proportion of the proteins, fats, carbohydrates, salts, &c., which accompany them in various foods. In this connection, phosphotungstic acid has been of value, for vitamins can be precipitated by means of this reagent. Thus, Funk extracted vitamins by means of acidified alcohol, and added phosphotungstic acid to the solution. The filtered and washed precipitate was decomposed, and further extensive purification attempted. The vitamins were thus concentrated, and, indeed, Funk at first thought that a pure substance had been isolated, but this was later shown to be erroneous. By boiling yeast in slightly acidified water for a short time it has been found that the vitamin can be taken into solution and filtered from the mass of coagulated protein. Similarly, if brewer's yeast be autolysed and filtered, the vitamin in the solution can be concentrated upon Fuller's earth by stirring the solution vigorously in the presence of 50 gm. earth per litre. The solution which previous to stirring with the porous earth contained 23 per cent. of solids still contains this amount, and yet all the vitamin has been taken upon the Fuller's earth. From this " vitamin-activated Fuller's earth " the vitamin cannot be washed out in any but small quantities by prolonged treatment with water, but alkali has been found to extract about one-half of the vitamin absorbed in the Fuller's earth, the rest being destroyed by the alkali. A separation of even approximately pure vitamin has not been effected from this alkaline solution or from the activated earth, but it has been possible to obtain standard activated earths, which may be used in physiological tests. Moreover, the activated earth is stable in the cold, and remains active for at least two years.

A great difficulty in all the above experiments in vitamin concentration is the loss of activity which occurs during manipulation, and the amount of vitamin originally present and approximately determined by feeding tests is by no means recovered, even after the most suitable treatment known.

Action of Heat and Oxygen

It was formerly thought that all vitamins were very unstable towards heat. It is now realised, however, that the resistance of some vitamins to heat has been underestimated. Thus, the fat soluble vitamin A can be heated to 120°C., in the absence of air, without losing its activity. For example, Hopkins finds that butter fat can be heated to 120°C. for four hours in the absence of air and still retain its vitamin A active. If, on the other hand, a stream of air be bubbled through during heating, the accessory food factor is destroyed. Similar conditions apply, of course, to the preservation of the activity of vitamin A of milk. Drummond has recently reported his results on the subject of the vitamin content of lard. It has been shown that the pig can store up vitamins which are fed to it—neither the animal nor the human organism can synthesise vitamins, but retains them when received in the food taken—and, therefore, the lard obtained from a pig suitably fed should contain vitamin A. Many lards, however, are deficient in this vitamin, and it is concluded that the high temperatures to which such lards are subjected in the course of manufacture and refining, *together with the presence of oxygen*, is responsible for the destruction of the fat-soluble vitamin. Lards prepared by the old " farmhouse " method, in which rendering at a fairly low temperature and quick filtration through muslin is practiced, retain their original quantity of vitamin, the combined effects of high temperature and oxygen access not being present in this method.

Drummond is of opinion that the absence of vitamins from many vegetable oils and manufactured oil products may be due to the association of the effects of oxygen and temperature, obtaining during refining. It is of interest to note here that ozone has been shown recently to destroy vitamins with rapidity. In general, then, it may be said that the fat soluble vitamin possesses considerable stability against the effects of heat, but it is easily susceptible to destruction by an oxidative action in the presence of air, oxygen or gases containing it, at raised temperatures. Passing now to the anti-scorbutic vitamin—water soluble vitamin C—we again find the effects of heat and oxygen in combination destructive. In the absence of air the vitamin C of swede, orange and other fruits is reasonably stable at 100°C. Indeed, orange juice, for instance, may be dried in vacuo without suffering much loss in vitamin activity. The vitamin C of cabbages—the richest vegetable in respect of this water soluble vitamin—is destroyed to the extent of 70-80 per cent. when cabbages are dried even at a low temperature. A somewhat similar anomalous result is observed in the canning of vegetables. The vitamin C of canned vegetables is very low, whilst canned tomatoes, on the other hand, retain a considerable proportion of their original anti-scorbutic vitamin. Generalisations are difficult to find in this matter, and progress is slow here again, owing in large measure, to the rather crude nature of the available methods for estimating vitamins.

Manufactured Foodstuffs

Under the special conditions obtaining to-day, it is inevitable that a large proportion of our food supply must be "manufactured." It will be sufficient to mention margarine, compound lards and lard substitutes, canned and dried fruits and vegetables, dried milk products, treated grains and cereals, &c. It is of obvious importance that attention be paid to the effect of manufacturing processes upon the vitamins contained in natural raw materials from which these products are made. It is true that these " manufactured " products are in most cases, of equal energy value and digestibility to the natural products which they are designed to supplant, and to the materials from which they are made. Since, however, the human system cannot synthesise vitamins, the destruction of the latter in the process of preparing artificial foodstuffs may have serious consequences. Let us consider the question of the fat soluble vitamin content of many present-day fats. It has already been stated that lard is deficient in vitamin A when prepared by the ordinary methods, due to the effects of oxygen and raised temperatures. Margarine prepared either from vegetable oils, a mixture of vegetable oils and oleo stearin, or compounded with hydrogenated and refined oils is more often than not deficient in vitamins. This is inevitable when one considers the methods of refining of vegetable oils in vogue to-day, keeping in mind the established properties of vitamins. Thus we know that the accessory food factors are very unstable towards alkali. They are selectively absorbed by Fuller's earth, and although the effect of a temperature of, say, 180 is not yet established, either in presence of air, or in presence of hydrogen, or in vacuo, it may be that such a high temperature is destructive of vitamins in itself. In any case, however, the refining or hydrogenation of a vegetable, animal or fish oil includes the steps of alkali treatment for the removal of free fatty acids, and the treatment with bleaching earths, such as Fuller's earth. In the event of hydrogenation, the oil is subjected to a temperature of about 170-180°C. for some hours—except in the case when a palladium catalyst is employed when a temperature of 80°-90° suffices. There is, however, only one company who employ the palladium catalyst, namely, the United Chemical Works, Charlottenburg. In the refining of oils too, the temperature employed is in this region of 170°-180°, although contact with steam

in vacuo obtains, and air is not present. It is therefore quite comprehensible that Drummond should find an absence of vitamin in every sample of hydrogenated oil examined. Very definite information as to the effects of heat, oxygen, alkali, Fuller's earth and the like, is needed, and research is being pushed forward in these matters. It is to be expected that interested parties should decline to accept the view that vitamins are usually absent from margarines. Such an attitude finds favour with cotton seed oil manufacturers and the producers of margarine and compound lard containing refined cotton seed oil. It is stated, quite truly, that cotton seed oil and other vegetable oils and hardened oils are equally or more digestible than butter, and that their energy value in calories is equal to or greater than that of butter fat. The variation of the vitamin content of butter fat according to whether the milk from which it has been made is rich or poor in vitamin is mentioned—milk from the same cow varying according to season, feed, &c., and milk from different cows varying when conditions of feed, &c., are identical. Finally, the experiments of Daniels and Laughlin (J. Biol. Chem., 42, 39) are referred to. These investigators found that rats fed upon a diet containing no vitamin except that contained in the cotton seed oil given not only did not show deficiency diseases, but thrived and grew normally, and reared their young.

Controversial questions cannot be entered into at this juncture, and the presence of vitamins in the milk with which the refined fat is emulsified in margarine manufacture must be conceded. None the less, there can be no doubt of the destruction of the vitamins of oils during the refining and hydrogenation of the latter. Hopkins has, however, shown (Bio. Chem. J., 14, 725) that the refining processes usually employed for arachis and palm kernal oils do not affect the vitamin content, which is, in any case, small. As the amount of vitamin necessary for the well being of the human system is not accurately known—in contradistinction to that in the case of animals—it is clearly of importance that the vitamins present in natural oils and fats be preserved as far as possible in the refining and manufacturing operations which they undergo. It may be proved later that we can well afford to dispense with the vitamin originally present in the oils we consume and which is destroyed in many cases in manufacture, but extensive research into this and many other problems must be undertaken before a definite opinion can be passed. Similar remarks may be applied to the question of the preservation of fruits, vegetables, meats, &c., by canning processes. The ease with which cabbage loses its vitamin C and the fact, in contradistinction, that canned tomatoes contain much of their original vitamin C, and that orange juice can be evaporated in vacuo without loss of vitamin have already been mentioned, but are again relevant in this connection. Milk, too, may or may not lose its vitamins on drying.

The ever-increasing extent to which the methods of desiccation and refrigeration are being applied in food preservation demands that increased attention be paid to the effect of these processes upon the vitamin content of the preserved food. At present, each individual product requires specific examination, in respect of its original content of vitamins, and of the effect of treatment. It is as yet not known what the exact effect of low temperature is, but this is a question of obvious importance. This, together with the definitive effect of high temperature alone —that is, in the absence of the complicating factor of presence of air—is being examined. The effect of keeping foods even at temperatures only slightly raised is not too accurately known. The influence of air at such temperatures requires examination. One significant observation in this connection is that butter fat, stable even at 120° C., in the absence of air, becomes deficient in vitamins when kept in extensive contact with air at 37° C.

It will thus be seen that the " manufactured " foodstuffs are liable to be seriously deficient in their content of the essential accessory food factors, and it is a matter of great importance that research should be continued, in an ever-widening direction.

Vitamin Action

The value of vitamins in human and animal diet is beyond question, but the nature of their action is still problematical. An interesting theory which has recently been reviewed by Haussler (Schweiz. Apoth. Zeit., 1920, 58, pp. 621, 634 and 655) may be noted. Haussler refers to the theory of Tschirch that the organism cannot unaided build up from aliphatic amino acids the cyclic structures such as purine and pyrimidine bases, essential in the formation of nucleic acid, and cellular nuclei. The synthesis is, however, possible in the presence of enzyme-like catalysts, " cyclokeiases," which contain, or are even identical with, the vitamins.

It has also been suggested by Walsche (Quart. J. Med., 11, 1917-1918, p. 320) that the vitamins play the part of enzymes. The theory is discussed by Seidell (J. Ind. Eng. Chem., 1921, p. 72) who finds many analogies between the two classes of substances. It is believed that the vitamins are concerned to a large extent in carbohydrate metabolism. Vitamins and enzymes occur together in many substances, and the action of heat upon them is very similar, though not quite so much so as might have been thought at one time, when the effects of oxygen upon heated vitamins were unrealised. Both vitamins and enzymes are similar in colloidal properties, although the anti-neuritic vitamin has been shown to be dialysable. There is the same progressive loss of activity in the attempted isolation of enzymes as has been noted in the attempted isolation and concentration of vitamins. Small quantities of both vitamins and enzymes are required in their respective actions, and other similarities are to be found. It is argued in this paper that a greater rate of progress in the study of vitamins will be realised if we adopt methods and ideas which acknowledge the undoubted similarity of vitamins and enzymes, but for the full arguments the author's original work should be consulted.

In conclusion, it may be noted that many problems of practical and theoretical value are on the verge of solution.

Beckenham Research Laboratory

THE Ministry of Health has sanctioned the application by Mr. H. S. Wellcome, of the firm of Burroughs & Wellcome, for a licence to use Longley Court, Beckenham, for physiological research. The Ministry held an inquiry at which residents in the neighbourhood protested against the application on the grounds that the laboratory would prejudice the neighbourhood's residential charms, deteriorate the value of property, and would be a " germ factory " causing risk of infectious disease.

During the war Mr. Wellcome carried on at Brockwell Park, Herne Hill, a laboratory for physical research, including the production of serum, and the army was largely dependent on it for supplies of serum, which, it is recognised, was the means of saving many lives. In 1919 the lease terminated, and Mr. Wellcome acquired Longley Court at Beckenham for £30,000, intending to establish a research laboratory. A licence was granted for physiological research, subject to the buildings not being used for trade purposes. Mr. Wellcome spent thousands of pounds in constructing the laboratories, but when plans were submitted to the urban council in respect of a water tower, a 60 ft. chimney, and other necessary extensions, sanction was refused. This situation led to the appeal to the Ministry of Health.

The Case for Chemical Warfare

To the Editor of THE CHEMICAL AGE

SIR,—I read Sir William Pope's article with great interest, and, as a chemist who served from October, 1914, till after the armistice, and as an infantryman, it seemed to me that he had crystallised the views, hitherto a little hazy, of the majority of those who know the facts on chemical warfare.

The object of one combatant in warfare is to annihilate the fighting forces of the other, either by killing, wounding, &c., or capture. The latter seems to have escaped Prof. Boycott, and Sir Wm. Pope would appear to have it especially in mind, as a careful perusal of his article will show. It is certainly far more humane, and much cheaper, to capture, say, a sneezing army than one which has had its mind and body racked with days and weeks of high explosive shells.

Sir Clifford Allbutt rightly refers to the irony of Sir William Pope, but I fail to see that he refutes any of his arguments. Perhaps he and Prof. Boycott will see them more clearly if they are put shortly :—

(1) Given suitable gases or vapours, an army may be put *hors de combat* for a time long enough for its capture (*i.e.*, annihilation, in the military sense) to be effected.

(2) The deaths from such an operation (on either side) are extraordinarily small.

(3) Such a method of winning battles and wars is much preferable to the present, wherein the bulk of the doctors are withdrawn for a long period from civilian service, and wars are prolonged, to the detriment of the food supply and general health.

The above appear to me unanswerable. I enclose my card, and remain, Sir, yours, &c., G.

June 8.

Bonus Shares and Super-Tax

To the Editor of THE CHEMICAL AGE.

SIR,—It cannot be too widely known that the important question of the liability of bonus shares to super-tax was finally decided against the Revenue by a majority of the House of Lords on the 3rd inst. Super-taxpayers should, therefore, realise that there is no liability to super-tax where undistributed profits have been capitalised and issued in the form of bonus shares. In the words of Lord Haldane in the case just decided (Commissioners of Inland Revenue *v.* Blott) : "I am, therefore, of opinion both on principle and on authority that, the transaction in the present case was one in which the company was in law dominant on the question whether the money was to be capital or income for all purposes, and I do not think that in the circumstances of this case the respondent received any income or profits at all."

An interesting question emerges from the foregoing : How many taxpayers have already mistakenly paid super-tax in respect of such bonus shares, and what arrangements are the Revenue authorities making to repay in such cases ?—Yours, etc., W. R. FAIRBROTHER.

67/68, Cheapside, London, E.C. 2.

Employers' Insurance

To the Editor of THE CHEMICAL AGE

SIR.—In 1914 seventy Lancashire employers controlling 64 works and having a total annual wages bill of just over a quarter of a million sterling decided to form an employers' mutual association, without restriction to trade, for the purpose of meeting their liability for workmen's compensation. On the 1st January, 1921, their Association—The National Employers' Mutual Indemnity Association, Ltd.—comprised employers having a total annual wages bill of over £20,000,000.

The reason for this rapid accession of new members is due to the fact that the "National Employers" is a mutual association worked entirely in the interest of its policy-holders. By a wise selection of risks, a low expense ratio and the provision in each works as the case may demand of ambulance rooms or first-aid cabinets, the association reduces its claims to the minimum and in consequence makes a very large profit. This profit (less amount apportioned to general reserve fund) is returned to the policy-holders in the form of a cash bonus every three years. The cash bonus to insured members for the years 1914, 1915 and 1916 was 15 per cent., and for the years 1917, 1918 and 1919 20 per cent.—Yours, etc.,

1-2, George Street, D. D. GOLDINGHAM.

Mansion House, E.C.4. June 11. Managing Director.

Chemical and Dyestuff Traders

Formation of a London Committee

ON Thursday week a meeting of the London members of the Association was held at the offices, 22, Buckingham Gate, S.W.1, to consider the question of forming a committee for the London area. On the motion of Mr. Waugh, seconded by Mr. John Brown, Mr. Chas. Page was elected to the chair.

A statement was submitted by the secretaries showing the steps which were being taken to establish similar committees throughout the country and indicating the kind of work the committees might undertake. It was stated that an excellent provisional committee had been formed in Manchester with Mr. F. P. Bayley (F. S. Bayley, Clanahan & Co.) as chairman, and Mr. A. Heywood (T. Paulding & Co., Ltd.) as honorary secretary, and that arrangements were being made for the formation of similar committees in Liverpool, Yorkshire and Glasgow.

On the motion of Mr. Butler, seconded by Mr. Waugh, it was unanimously resolved "that a committee of the Chemical and Dyestuff Traders' Association be formed for the London area to consist of seven members, four to form a quorum."

The following were nominated and duly elected to constitute the committee : Messrs. A. F. Butler (R. W. Greeff & Co., Ltd.), John Brown (Brown & Forth, Ltd.), W. T. Bruce (W. T. Bruce & Co.), D. C. Christopherson (Clifford Christopherson & Co.), John Gordon (Fredk. Boehm, Ltd.), Chas. Page (Chas. Page & Co., Ltd.), and W. Waugh (Walter Waugh & Co.).

The first meeting of the committee was fixed for Monday, June 20, at 2.30 p.m.

Reparation Levy Arrangements

The Association is authorised by the Treasury to state that the German Government has definitely accepted and agreed to carry out the obligation to refund to German exporters the 26 per cent. to be paid direct to the British Customs by British importers as Reparation Levy on German goods coming into the United Kingdom. The only point not yet finally settled is the form of receipt to be issued by the Customs in this country for acceptance by the German Government. The latter, the Association is informed, has asked the British Government to state precisely the procedure it desires the German authorities to follow and to submit a draft form or forms of receipt.

The Association further states that reports received from members show that some of the large German firms who formerly refused to export goods to the United Kingdom unless prepaid in full, have now informed British firms that they are prepared to accept 74 per cent. of the value, and to rely on their own Government refunding to them the 26 per cent. deducted at this end for payment to the British Customs. In the case of German goods imported into the United Kingdom through a neutral country, and not therefore liable to the 26 per cent. duty at this end, it is emphasised that not only must the goods actually have left German territory, but there must have been a definite sale to some firm in the neutral country from which the goods are imported. The exemption from liability to pay the duty at this end applies also to goods exported from Germany to any country other than the United Kingdom to the order of a British buyer. For example, a British firm buying German goods for export, say, to a customer in Shanghai, may have them despatched from Germany direct to the customer. In such a case no tax is payable by the British firm ordering them.

Over four million gallons of mineral oil has arrived at Swansea during the past few days from Abadan, one cargo, per the s.s. "British Knight," amounting to 1,754,887 gallons, and another, per the s.s. "British Admiral," to 2,617,406 gallons.

Lieutenant-General Sir BEAUVOIR DE LISLE unveiled at Northwich on Saturday, June 11, the memorial obelisk, guarded by four finely-chiselled granite lions, to the 291 employees of Brunner, Mond and Company's Winnington, Lostock, Sandbach, Middlewich and Silvertown chemical works, and their Liverpool, China and India offices, who fell in the war. Sir Alfred Mond, Minister of Health, said it was in the spirit in which the country entered the war that we must face and conquer the no less serious difficulties of peace.

Reviews

DICTIONARY OF APPLIED CHEMISTRY. By Sir T. E. THORPE, C.B., F.R.S., LL.D., assisted by numerous contributors. London: Longmans, Green & Co. Vol. I. Pp. 752. 60s. net.

Sir Edward Thorpe's comprehensive dictionary, with its world-wide reputation, may truly be described as a "magnum opus" from every standpoint. Not only is it a great work from the point of view of bulk, but it provides a wonderful source of information on every conceivable branch of technical chemistry. Certainly, it is expensive, but this fact is all to its advantage, for recognised authorities cannot be persuaded in busy times such as the present to write up their own particular subjects without adequate remuneration, and Sir Edward Thorpe is not a person to let expense stand between him and the provision of the best.

Volume I. only of the new edition has so far appeared but it is understood that the second volume is practically ready for publication. The new edition was considerably delayed by the war, mainly owing to the fact that some of those who contributed to previous editions were actively engaged as combatants, while many others were employed in industries or research closely connected with the pursuit of the war, and were therefore deprived of the time and opportunity for dealing with their special sections. This, however, is all for the best, for had the dictionary appeared earlier it must necessarily have dealt with a transition period, it would have been difficult to have drawn any definite conclusions from evolutions in scientific work which were occurring, and the whole of the material would have required revision at a comparatively early stage. The main requirement of a series of reference books of this nature is that they shall contain information which keeps reasonably up to date for at least five years, for the complete work costs about £20, and—apart from public institutions and the large industrial undertakings—frequent editions would prove something of a hardship to many of those who regard the work as indispensable. The material given, however, is intended to represent a reasonably adequate idea of the state of contemporary knowledge concerning the applications of chemical science; but in certain directions no authoritative information can as yet be obtained, which will explain why manufacturing details of several new processes have been omitted.

The volume under review covers the range A to Calcium, and is to be followed by five, and possibly six, others. One of the larger contributions which immediately arrests attention is that dealing with alizarine and allied colouring matters, which has been written by Professor W. H. Perkin, Dr. Robert Robinson and the Rev. F. H. Gornall, M.Sc. This section consists of no fewer than 25 pages dealing in detail with the history of the synthetic production of alizarine and the various derivatives of anthraquinone. The section on analysis is the largest in the volume, consisting of over a hundred pages, contributed by Dr. G. T. Morgan and Dr. Mollwo Perkin, the latter dealing the electrochemical principles. Dr. Morgan points out that, while for the purposes of scientific investigation the most accurate methods are essential, for ordinary technical purposes extreme accuracy is rarely required, so that rapid methods giving approximately correct results are generally preferred. It is in this direction that volumetric analysis has been most extensively developed, the general tendency in industrial laboratories being to replace gravimetric methods by the quicker volumetric processes with but little loss in accuracy. The assaying of metals is in the hands of Sir Thomas Rose, of the Royal Mint, who points to the antiquity of the art, and deals with his subject in a most entertaining fashion from the time of Pliny. The principal metals and the method of determination applied with each one are discussed, while there is some useful information relative to such preliminaries as sampling and grinding.

The articles mentioned above have merely been picked out as indicative of the general excellence and completeness of the information given. Obviously, a dictionary is not designed to be read from cover to cover, like an ordinary text-book, and the reviewer has not attempted such an undertaking. When the prospet of doing this is considered, however, one is able to form some opinion of the gigantic task which Sir Edward Thorpe has set himself. His reward lies in the admiration which all his colleagues in science and industry have for his untiring purpose. The majority of us would regard such an ordeal as self-immolation in its most generous form, and only those who know Sir Edward's capacity for work can appreciate that he finds solace in achievements of this description. C. A.

TECHNICAL METHODS OF ANALYSIS. Edited by R. C. GRIFFIN. London: McCraw Hill Book Co. (Inc.) Pp. 666. 33s.

This closely written volume of some 600 pages is a collection of analytical methods as emplyed in the large commercial laboratory of Arthur D. Little, Inc., Cambridge, Mass. The range of materials treated is very large and includes practically every analysis which a general worker is likely to be called upon to undertake. Certain sections, indeed, as the author indicates in his preface, have been omitted as being of interest to specialists only in those particular sections, but apart from these a very wide field has been covered. The methods of analytical procedure have been given in ample detail and with a pleasing absence of the assumption, so common in more academic publications, that the reader does not know a thistle funnel from a Bunsen burner.

Specialists in each particular branch treated in this volume might find minor things to critise in the methods. For instance, it is obvious that the method given for antimony oxide in antimony sulphide (p. 35) by hydrochloric acid extraction, really refers to total antimony and not to the free oxide, which necessitates tartaric acid extraction for its estimation. Again, in treating of crude wood alcohol (p. 371) it is implied that Messinger's method gives an estimation of acetone alone, while Denigès' method gives total ketones, whereas in point of fact Denigès' method invariably gives much lower results than any iodoform method.

To English chemists the habit of referring the methods to the American technical associations rather than to the originators is apt to be somewhat irritating, but, as the author acknowledges in his preface, it has not been found possible to give proper credit in each case. However, quibbles of this kind cannot by any means detract from the value of a compilation whch can be thoroughly recommended as a library in itself to the general worker. W. R. O.

HANDBOOK OF METALLURGY. By Dr. Carl Schnabel. Translated by Henry Louis, M.A., D.Sc., A.R.S.M., M.Inst.C.E., F.I.C., &c. Third Edition, Vol. I.: Copper—Lead—Silver—Gold. Geographical and general indexes. MacMillan & Co. Pp. 1134. 40s.

The fact that this is the third edition of the handbook, the first of which appeared in 1898, is abundant evidence that Professor Louis in translating Schnabel's "Metallurgy" has conferred a great benefit on the students of that subject. As pointed out in the preface to the first edition, there existed at that time no single complete treatise on metallurgy in the English language.

The present volume is concerned with the metals copper, lead, silver and gold and extends over some 1,100 pages. The account given of the extraction of these metals is full and comprehensive, is notable for the description of the processes and practice in various parts of the world; further, these descriptions are amply supplied and illuminated by the numerous illustrations and detailed drawings of furnaces and plant employed.

Under the heading of "Lead" is to be found a discussion of the various processes of "blast-roasting," the object of which is the conversion of sulphides into oxides, preliminary to blast-furnace treatment, processes which while, as pointed out, are applicable to copper and lead ores, have mainly found adoption in lead smelting. These methods of treatment are represented by the Huntington-Heberlein and the Dwight and Lloyd processes, are responsible for far-reaching modification of lead-smelting operations.

In the section dealing with gold is an interesting account of the cyanidation process, or, as it is usually styled, the MacArthur-Forrest process. This method of treatment is based on the observation of the solubility of gold in potassium-cyanide solutions, first, apparently, made by Scheele, and gradually found its way into chemical textbooks (*e.g.*, Odling's, "Outlines of Chemistry"). The reaction depends upon the formation of the soluble double cyanide of gold and potassium, in which the oxygen of the air also plays an essential part. Silver is similarly attacked, and it is interesting to note that the solvent action of solutions of sodium chloride on silver is dependent on the formation of a double chloride of sodium and silver, similar to the double cyanide.

It should be stated that this edition is not simply a translation of a corresponding German edition, but, as we are informed in the preface, has been revised and extended by the translator himself—a course adopted "mainly because the original author, Dr. Schnabel, had died and the German work had been entrusted to other hands; further all the important modern improvements in metallurgical practice were to be found in English-speaking countries."

The war has been responsible for delay in the publication of this volume, for much of it was in type in 1914; nevertheless, the work is well up to date and Professor Louis is to be congratulated on the production of a handbook indispensable both to the student and to the practitioner of metallurgy.

BIBLIOTHECA CHEMICO-MATHEMATICA. Catalogue of works in many tongues on exact and applied science, with a subject index. Compiled and annotated by H. Z. and H. C. S. Two volumes. London: Henry Sotheran & Co. Pp. 964. £3. 3s. nett.

This catalogue was begun in 1906 as that of a large collection of books in exact and applied science, and was expected to reach about 300 pages. It grew so fast that by the end of the alphabet so many more works in allied subjects, as well as other and interesting copies of books already described, had come in that a supplement was begun, still more fully annotated, which far exceeded the size of the original scheme. To this a final supplement was added, and the whole was indexed under a full classification of subjects. The result is claimed to be the first historical catalogue of science published in any country, at least as giving at once the current price of each book included, bibliographical particulars, and many biographical and historical references both in the descriptions themselves and in the notes. As the catalogue is one of books for sale, it does not pretend to be complete, but it is hoped that few of the great books are missing.

The whole work is due to Heinrich Zeitlinger, of Linz on the Danube, whom his colleague "H.C.S." describes as "an equal well-wisher of learning and of England." The work of the latter has been the lesser one of revision and proof-reading. The two volumes are a monument of literary industry, and the reproductions of original plates and the bibliographical notes will make their inevitable appeal to every bookman.

KEMPE'S ENGINEER'S YEAR-BOOK, 1921. London: Crosby Lockwood. 30s. net.

This is the 28th annual issue of this incomparable book of reference, which now contains 43 separate sections, upwards of 2,600 pages, and 2,250 illustrations. As is well known, "Kempe" is the only really comprehensive book of its kind published in this country, and it has come to be looked upon as a form of condensed technical library, supplying in an accessible manner all the information relating to those facts and formulæ which even the man with the best of memories cannot carry in his head. It is essentially a desk companion having but one disadvantage, namely, that it has now grown to such gigantic proportions that it is the last thing one would wish to carry about. A handbook as such, however, must always labour under a disadvantage in that the compiler is faced with the problem of having to reconcile two contrary requirements, namely, portability and completeness. If you have the one then the other must necessarily be sacrificed, and Mr. Kempe prefers to give his readers all rather than only a portion of the information they may require, even if, in so doing, he removes his volume a long, long way from the category of the "pocket" book.

Although this is called an engineer's handbook, it contains a host of everyday facts of which the chemist and chemical engineer, more particularly those who are in charge of works, must be continually in need. The chemist *per se*, however, will find particular interest in the following sections: "Steam Boiler Plants" (D. Brownlie), "Power Gas" (Vincent Clarke), "Metallurgy" (Owen Ellis), "Pulverised Coal" (L. C. Harvey), "Gas and Gasworks Practice" (Alwyne Meade), "Explosives" (Professor W. R. Hodgkinson), "Fuel" (Harold Moore), and many shorter contributions on such unusual subjects as the creosoting and seasoning of timber, ice making, and acetylene manufacture. The goodwill which exists between the compiler, the technical Press, and the technical societies and institutions is illustrated by the fact that official permission has been given by many of the last named for publication of important information abstracted from their proceedings, while the technical history of the previous year is collated from extracts taken from the review number of the *Times Engineering Supplement*. It is worth while recording that the original issue of 1894 contained 600 pages. The current volume has improved upon this figure to the extent of 330 per cent.

SMITHSONIAN PHYSICAL TABLES. Seventh edition. (Published by the Smithsonian Institute, Washington, and prepared by Frederick E. Fowle.) Pp. 450.

The present edition of this well-known reference book is a considerably enalrged one, about 170 new tables having been added, including those on colloids, photography, geochemistry and atomic and molecular data. The subject-matter is divided substantially into mathematical, mechanical, acoustical, thermal, optical and electrical sections, and the reader will find in these matter which is not available elsewhere, except after laborious search.

Standard works of this kind are indispensable for the technical worker's bookshelf. It does not follow that they are in daily use, but the comfort of knowing that such comprehensive information is available at a moment's notice must in the long run be a great help. The standardised spelling and abbreviations of the common units of weight and measure are valuable, and it is deplorable that they are not more widely adopted in scientific literature and in the technical press.

Other features are the tables of viscosities and vapour pressure, specific and latent heats, cooling by radiation and convection, and an admirable index. There has been a tendency in recent years to duplicate the various books of reference, and also chemical and physical tables, but the present work sets such a high standard of excellence that it can welcome competition and imitation as an acknowledged leader in the field. C. J. G.

THE CHEMIST'S YEAR BOOK, Vols. I. and II.; sixth edition (1921). Edited by F. W. Atack, M.Sc.Tech., B.Sc., F.I.C., assisted by L. Whingates, A.M.C.T., A.I.C. Manchester: Sheratt & Hughes.

The fact that this well-known work, comprehensive in its range and yet of a convenient size, has reached a sixth edition is sufficient evidence of its usefulness as a handy reference book. The general features, which have been noticed in reviews of earlier editions, remain substantially the same. Apart from corrections of a minor character, revisions have been introduced in the "Fuels and Illuminants" section by H. Moore; in the "Crystallography" section, by E. H. Rodd; and in the "Cellulose" section, by C. F. Cross. The "Coal Tar" section has been completely re-written by W. H. Coleman. The editor invites "even drastic comments" which may prove of service in increasing the general utility and reliability of the Year Book.

Manufacture of Sodium Perborate

A New Norwegian Process

THE New York *Journal of Commerce* of April 21 contains an article on an invention which has just been patented by the Norwegian firm Fredrikstad Elektrokemiske Fabriker, for producing sodium perborate, which has never been produced in Norway or in Sweden.

The process consists of an electrolysis of common borax in a weak solution. In this way the borax combines with a large percentage of oxygen. One of the disadvantages inherent in the processes utilised hitherto has been that a large percentage of electric energy and borax was wasted. Another disadvantage was that only chemically pure borax could be used; and, finally, a third disadvantage consisted in the difficulty of maintaining a continuous and constant production.

Both of these last-named disadvantages have been overcome by adding to the original borax solution a certain amount of sodium cyanide. This addition, it is stated, makes all the impurities harmless, and prevents decomposition of the perborate which is formed in the solution. It is, therefore, possible to utilise raw material less pure, and therefore less expensive, thus lowering the cost of production; continuous production is also made possible.

When the solution is saturated it is poured out and cooled; thereupon a certain amount of sodium superoxide is added, which causes a rapid crystauisation of the perborate.

New Chemical Standard Steels

Analytically Standardised Turnings

TWO new plain carbon steels standards are now ready for issue, viz., "M"—needed for some time mainly for colour carbon tests round about 0·23 percent. and "O1," which fills the vacancy for a colour carbon standard of about 0·33 per cent. in addition to being available for the other elements shown below.

The analyses have been undertaken as usual by a number of experienced chemists representing the following interests:—British Government Department; U.S. Bureau of Standards; Referee Analysts—independent; Railway Analysts—representing users issuing specifications; and Works Analysts—representing makers and users.

The standard figures are as follows:—

	"M"		"O1"
Carbon	0·228	...	0·333
Silicon	0·057	...	0·162
Sulphur	0·05*	...	0·032
Phosphorus	0·04*	...	0·031
Manganese	0·6*	...	0·617
Arsenic	—	...	0·024
Chromium	—	...	0·017
Copper	—	...	0·037
Nickel	—	...	0·162

* Approximate.

The standards may be obtained either direct from Organising Headquarters, 3, Wilson Street, Middlesbrough, or through any of the leading laboratory furnishers, at a price just sufficient to cover the cost. A certificate giving the names of the analysts co-operating, the types of methods used, and a detailed list of their figures will be supplied with each bottle.

Society of Chemical Industry

Official Announcement of New President

IN THE CHEMICAL AGE of June 4 we were able to announce the decision to nominate Professor Ruttan, of Montreal, as president of the Society for next year. This is now officially confirmed by the announcement in the new number of the Society's journal that the matter was considered at the last meeting of the Council. In view of the impending annual meeting in Canada, the Council had requested the Canadian sections to suggest one of their members for nomination to the office of president for 1921-22. The sections proposed Prof. R. F. Ruttan, director of the chemistry department, McGill University, Montreal, and the Council nominated him for election at the annual general meeting.

Four vice-presidents retire from office this year. The retiring president, Sir William J. Pope, becomes a vice-president, and the Council nominated Mr. J. L. Baker, Mr. C. S. Garland and Mr. Max Muspratt to the three remaining vacancies. Mr. W. J. U. Woolcock, M.P., was elected an ordinary member of Council, in place of Mr. W. J. A. Butterfield resigned, for the period ending with the close of the annual meeting, 1921; he is, however, eligible for re-election at that meeting. Mr. E. V. Evans was reappointed hon. treasurer, and Prof. H. Louis hon. foreign secretary. It was intimated that June 15 is the last day for receiving nominations of ordinary members of Council.

It was decided to hold the annual dinner of the Society in London early in October. Forty new members have been elected since the April meeting of Council.

Action Between Chemical Companies

ON Tuesday in the Commercial Court, King's Bench Division, before Mr. Justice Bailhache, counsel mentioned the case of Johnson Bros. (Manufacturing Chemists), Ltd., against the Aniline Dye and Chemical Co., Ltd., which was in the list for hearing, and said he was instructed to ask for a stay of proceedings on behalf of the plaintiffs, with liberty to restore, as there were certain proceedings pending against the defendant Company.

His Lordship directed accordingly.

Bleaching of Oils and Fats

Claims of New German Preparations

IN the *Chemiker Zeitung* (June 9), Dr. Steinau ,of Nurnberg, claims considerable advantages for the German bleaching earth preparations, notably those brought out under the trade names of Frankonit, Silitonit and Tonsil. The process of bleaching, he claims, is greatly simplified, and the bleaching effect markedly superior to that obtained with ordinary fullers' earth of English or American origin. Large deposits of aluminium hydrosilicate have been found in Germany, and by special chemical treatment the bleaching power of the original earth has been considerably enhanced, even to the extent of 100 per cent. it is alleged, whilst the waste of oil, *i.e.*, the amount left in the filter-cake, is considerably less. The bleaching effect is said to be increased by subsequent exposure to sunlight.

The preliminary refining with sulphuric acid and the actual bleaching process are carried out in iron vessels, steam-heated and fitted with mechanical stirrers. Any acid left in the oil after treatment with sulphuric acid must be carefully removed, not by direct neutralisation with alkali, but by addition of the specially prepared earths above named, Frankonite, &c.

For example, olive oil was stirred up and heated to a temperature of 38°C. to 40°C., and from 3 to 5 per cent. of Frankonite—or one of the other earths—was added. Green olive oil, obtained from olive oil press residues, was stirred up with 2 to 3 per cent. of strong sulphuric acid for 40 minutes at a temperature of 50°C. to 55°C., and after removal of the dark-coloured scum the supernatant oil was drawn off into another vessel where it was heated to about 60°C. to 65°C. with addition of 20 per cent. hot water to wash out the acid. When boiling the mixture is stirred for about 30 to 40 minutes. After standing for a time the de-acidified oil is drawn off, again heated to 40°C. to 45°C., and stirred up with silitonit (F. grade) for 75 minutes, the temperature being raised to 100°C. It is finally filtered. In the case of linseed oil and rape oil an almost water-white oil is obtained by using 5 to 10 per cent. of silitonit (F. or S. grade), and heating to 90°C.

Light mineral oils of sp. gr. up to 0·85 yield a clear water-white product, using 3 to 5 per cent. of bleaching earth and heating up to 80°C. for 30 to 40 minutes. Heavy mineral oils of sp. gr. up to 0·95 may be similarly treated with 5 to 10 per cent. earth and heating up to 120°C.

Castor oil, cotton-seed oil, palm oil and coconut oil, also waxes, may all be well bleached by this method. In the case of rancid fats of animal origin it is recommended that small tests be made in the laboratory to determine the best proportions of bleaching earth and the optimum times and temperatures before working on a large scale.

Mr. Ernest Benn's American Tour

MR. ERNEST J. P. BENN, managing director of Benn Brothers, Ltd., who left on Saturday, April 23, accompanied by Mr. Frank H. Elliott, another director, for a visit to the United States, arrived back in Liverpool on Tuesday last. On his return to the office on Wednesday, Mr. Benn found awaiting him in the Board Room a presentation from the Staff, consisting of a handsome leather attaché case with an inscribed silver plate inside, and a gold-mounted Waterman pen, also inscribed. Accompanying the presents was an unsigned card in the following terms:—

"To Mr. Benn.—The Staff of Benn Brothers, Ltd., ask your acceptance of the accompanying attaché case and fountain pen as a very simple but sincere expression of welcome on your return home."

The Nitrate Position

AN agreement has been come to between the President of the Republic and the Minister of Finance, and the members of the Nitrate Association to continue until the 30th inst. the negotiations with the owners of nitrate stocks in London, with a view to reaching an understanding between the latter and the Chilian producers.

Magnesium Sulphate as a Fertiliser

A German Authority's Opinion

DR. A. JACOB, in a recent article in the *Chemiker-Zeitung*, states that it has long been known that magnesia is an important plant food; Liebig established this fact on the basis of ash analysis. As the parts of plants which are rich in protein also show a high magnesia content, it was assumed that magnesium is connected with the synthesis of the nuclein type of proteids. Löw concluded from his micro-chemical experiments that the functions of lime and magnesia in the plant were closely related and dependent on each other, and that it was necessary to supply these plant foods in definite proportions. The relative proportion of lime to magnesia necessary to produce a maximum yield of any particular crop was called by Löw the lime factor. According to him it was for grasses 1 : 1, cabbage 2 : 1, tobacco 30 : 1.

A series of Japanese investigators, Daikukara, Nakama, Kumakiri, Takeuchi, also the Italians Bernadini, Corso and Sinischalchi, and in Germany, Fallada, Greisenegger and Warthiadi, confirmed by their experiments the lime factor theory of Löw. Generally speaking, however, investigators have repudiated this theory. D. Meyer, Wheeler and Hartwell, Konowalow, Lemmermann, Haselhoff, Nolte, Mitschrlich and many others definitely established the fact that crop yields were not influenced, although the proportion of lime to magnesia was changed even within wide limits. Löw brought nothing forward to refute this, and his theory as to the importance of magnesia could not be regarded as "worked out."

The importance of magnesia appeared in a new light when Willstätter, in 1907, showed that the composition of chlorophyll was an organic magnesium compound containing .3 per cent. magnesium. The high magnesium content of chlorophyll suggested that magnesium plays a part in the chief function of plants—viz., the photosynthesis of carbohydrates. As attention in the earlier research work was concentrated on the proportion of lime to magnesia, there are practically no systematic data relating to the fertilising use of magnesia, such as a knowledge of the combination and quantity in which magnesium should be applied, which plants are specially responsive to it, and on which soils it is most effective. Quite a large number of good results have been obtained from manuring with magnesium sulphate—*e.g.*, by Gilberts, Sprengel, V. d. Goltz, Pincus and Rölling, Sirker and Daikuhara, Rigeaux and D. Meyer. A strong indication of the favourable effect of magnesium sulphate is also afforded by the fact that the crude potash salts, which are characterised by their content of magnesium sulphate, give on certain crops a better result than the pure salts. If this view should be confirmed, it will probably be found that the magnesium needs of our soils have been satisfied to a large extent by manuring with kainit, which is known to contain sulphate of magnesia.

Sulphate of magnesia, which appeared from the results of earlier trials the most hopeful of the magnesia salts from the fertilising point of view, was carefully tested in an elaborate series of experiments carried out from 1917 to 1919 on potatoes, on different types of soil and at widely different places in Germany and Holland. The magnesia was applied as 2 cwt. kieserite per acre—*i.e.*, the same form as the magnesia present in sulphate of potash-magnesia. The average increase in yield obtained from the addition of sulphate of magnesia was 5 cwt. per acre.

The results also showed a definitely better effect of the sulphate, as compared with the chloride, on the starch yield. The sulphate dressings gave on the average 2⅜ cwt. more starch per acre than the corresponding chloride dressings. It is quite possible that the increase in starch from the addition of kieserite to the muriate of potash was due not to the magnesia, but to the sulphate ion.

The results of the above experiments, Dr. Jacob concludes, certainly show that under certain conditions and on certain types of soil the inclusion of magnesium sulphate in the manuring may be markedly beneficial to potatoes.

During the forthcoming visit of the Society of Chemical Industry to Canada Captain C. J. GOODWIN will represent the Chemical Industry Club and will convey the greetings of the committee of the Club to the Chemical Club of New York and other similar bodies.

Brunner, Mond & Co.

Works Closed for Want of Coal

MR. ROSCOE BRUNNER, presiding over the annual meeting of Brunner, Mond & Co., at Liverpool, on Wednesday, said that this week the fuel stocks of the company became exhausted. As a consequence they had to close their Wilmington and Lostock works, but the Middlewich and Sandbach works were going on at a low rate. The company had suffered through trade depression, the gross trading profit being down by £322,000. The trade had suffered the most serious slump that had ever been known, and it had been aggravated by the coal strike. The hard logic of events had shown trade union leaders that their policy of fighting wage reductions to the death was wrong. There must be more reductions in wages, as those already effected had not kept pace with the reductions in the cost of living.

Every class in the country, Mr. Brunner continued, must accustom themselves to the idea that their increased standard of comfort was not a permanent one. They might have to submit to a standard below that of the pre-war time. The Government would have to help by reducing the cost of Government. Ever Government service which was not a vital necessity must be scrapped, and he included all subsidies. The natural flow of economic law must be allowed to resume its sway. He suggested that the country should not be deceived by the boomlet which would probably follow the end of the coal stoppage into thinking that good conditions were already returned. He still feared that in the near future there would be violent fluctations in trade, with an upward tendency, which would only be gradual.

A shareholder protested against the low dividend of 8 per cent., which drew from the chairman the observation that dividends everywhere would go lower until trade conditions had so improved as to be reflected in accounts.

The Bases of the Soil

AT a meeting of the recently-formed chemical club at Aberdeen Professor Hendrick read a paper on "The Bases of the Soil." From every part of view (he said), physical, chemical and biological, the soil was a very complex and variable material, and its study involved many difficulties. It had hitherto been held in Britain, and has passed into ordinary textbooks, that carbonate of lime always played a very important part in the changes which took place in soil; in fact, it had been almost invariably taught that the lime which it contains formed the reservoir from which a base was obtained for the reactions constantly taking place in the soil. In the North-East and in many other parts of Scotland, and in parts of England, there were soils which contained no carbonate of lime. Most of the soil studies, however, on which our textbook knowledge was based had been made in the South-East of England, and the ordinary orthodox view of the soil was biased by this limitation. The lecturer dealt with his own investigations of the soil of Crabstone experimental farm, and showed that it contained a great reservoir of base in the form of easily decomposable silicates, and that it was base derived from this source which played the part taken by lime in the soils hitherto regarded as typical. In the case of Crabstone and similar soil it was not lime only which plays the basic part but a mixture of the bases soda, lime, and magnesia, and soda might in certain cases play quite as important a part, quantitatively, as lime.

An account was given of certain experiments on the power of Crabstone soil to fix the bases of manurial compounds, and it was shown that the power of the soil to fix potash from muriate of potash became exhausted much more quickly than its power to fix ammonia from sulphate of ammonia.

Industrial Chemists at Madras

IN view of the prospective industrial development of the Presidency and the probable demand for industrial chemists, the Madras Government have approved the recommendations of the Director of Industries to increase the number of scholarships to graduates for the study of applied chemistry at the Indian Institute of Science, Bangalore, from ten to eighteen from April 1, 1921.

New Chemical Enterprise

AT a time when many firms are anxious about the future, it is interesting to hear from Hulse & Co., 12, South Parade, Leeds, of their enterprise for new chemical works and laboratories for the production of chemicals, dyes, intermediates, oils, coal tar products, &c. The new works, which are at Woodlesford, cover six acres and are bounded on one side by the main line between London and Leeds and on the opposite side by the Aire and Calder Navigation Canal. Alterations are being carried out at the works and plant is being put down for the manufacture of intermediates, pure anthracene, pure naphthalene, black oxide of iron, chlorophyll, synthetic perfumes, &c. Dr. H. H. Hodgson in a note on the new undertaking writes: "The alarming state of our pre-war chemical affairs may be painfully realised by the fact that the final products of our coal tar distillers were bought as raw material by Germany and returned to us at enormously enhanced prices in the form of dyes, drugs, and fine chemicals. Every effort, therefore, to retrieve such a position deserves encouragement, and in this respect the advent of Messrs. Hulse & Co. as manufacturers of chemicals is to be welcomed. The head of the firm is a chemist of wide experience, itself a guarantee for the scientific control of the undertaking, and from my own knowledge of his outlook and ability, I believe the firm's success is assured. The future of our country is dependent largely on the good results of such pioneering enterprise, and these, assisted by helpful legislation, should reduce and finally remove our chemical handicap with its grave menace to our security and prosperity."

The sole principal is F. Hulse, formerly chief chemist with Brotherton & Co., Ltd., and all communications after July 31 should be addressed to Hulse & Co., Woodlesford.

Pharmaceutical Conference

THE British Pharmaceutical Conference, attended by nearly 400 delegates, opened at Scarborough on Tuesday, June 13, under the chairmanship of Mr. E. Saville Peck, the president. The Mayor (Alderman M. T. Whittaker) dealt with the value of advertising, and drew a contrast between the position of chemists to-day and in his boyhood, when the doctor was associated with the barber and the chemist with the grocer, as regarded the status of their callings.

Mr. E. Saville Peck, in his presidential address upon "British pharmacy and its possibilities," outlined the present unsatisfactory position of the practice of pharmacy, and urged members to work for the establishment of a distinct profession of pharmacy on the lines of that which obtained upon the Continent and is suggested in the United States. He advocated a wider preliminary education for all those entering the calling, and a university degree in science with pharmaceutics as one of the final subjects, and strongly urged the institution of a fellowship examination to include biochemistry and bacteriology with clinical microscopy. Such an examination and the training required for it would enable students to carry out clinical analyses and to assist in the diagnosis of disease.

Subsequently a number of scientific papers were read.

How Germans Use Advertisement

IN the report just issued on the economic and financial situation of Egypt by Mr. E. H. Mulock, H.M. commercial agent at Cairo (Department of Overseas Trade, 1s. net.), attention is drawn by the writer to the urgent need of the more systematic advertisement, especially through trade journals, of British productions. "German agents" he states, "are again opening an extensive advertising campaign in both the European and native Press for practically all their pre-war products, the prices quoted being comparatively low. A German trade journal, published in Berlin and printed in French and Italian, is circulated freely among European and native business houses in Egypt. Its object, which is to resuscitate German trade with Egypt, appears to be meeting with some measure of success. According to the language in which it is printed, it is entitled *Revue d'Exportation et Importation* or *Revista d'Exportazione ed Importazione*. The Italians are also making a special effort to capture much of the trade formerly in British hands by open advertisement, and by means of well organised propaganda."

U.S.A. Chemical Control Bill

Text of Provisions

THE complete text of the dye and chemical control title of the U.S.A. emergency tariff bill, as agreed to in conference, is as follows:—

Title V.—Dyes and Chemicals

Section 501. (*a*) That on and after the day following the enactment of this Act, for the period of three months, no sodium nitrite, no dyes or dyestuffs, including crudes and intermediates, no product or products derived directly or indirectly from coal tar (including crudes, intermediates, finished or partly finished products, and mixtures and compounds of such coal-tar products), and no synthetic organic drugs or synthetic organic chemicals, shall be admitted to entry or delivered from Customs custody in the United States or in any of its possessions unless the Secretary determines that such article or a satisfactory substitute therefor is not obtainable in the United States or in any of its possessions in sufficient quantities and on reasonable terms as to quality, price and delivery, and that such article in the quantity to be admitted is required for consumption by an actual consumer in the United States or in any of its possessions within six months after receipt of the merchandise.

(*b*) Upon the day following the enactment of this Act the War Trade Board Section of the Department of State shall cease to exist; all clerks and employees of such War Trade Board Section shall be transferred to and become clerks and employees of the Treasury Department and all books, documents, and other records relating to such dye and chemical import control of such War Trade Board Section shall become books, documents and records of the Treasury Department. All individual licences issued by such War Trade Board Section prior to the enactment of this Act shall remain in effect during the period of their validity, and the importations under such licences shall be permitted. All unexpended funds and appropriations for the use and maintenance of such War Trade Board Section shall become funds and appropriations available to be expended by the Secretary in the exercise of the power and authority conferred upon him by this section.

Section 502. That this title may be cited as the "Dye and Chemical Control Act, 1921."

A Period of Five Years

The statement was made in the Senate on May 23 that the Committee on Ways and Means of the House will recommend that the licensing and embargo provisions contained in the emergency tariff Bill be continued for a period of five years. Senator King characterised such legislation as un-American and indefensible on any economic grounds. He declared that it would perpetuate a dye monopoly in the United States.

German Dyestuffs Industry

A DUSSELDORF report states that the Entente have failed to take over anything like the quantity of coal-tar colours to which they were entitled under the Versailles Treaty, and they have not been able to absorb even the amount that they did receive. Fairly large quantities are said to have been re-exported to neutral countries, and some of the dyestuff has actually found its way back to Germany. The immediate outlook for the industry is considered to be unsatisfactory. In almost all countries the textile and other colour-consuming industries are stagnant, while the introduction of the licence system, early in the year, by Great Britain and the probability that America will adopt similar restrictive measures, are regarded as adverse factors. The South American Republics are at present the best markets for German dyestuffs. China, which was a large buyer immediately after the Armistice, has taken very little for some time, but Japan is again beginning to buy rather more freely. The domestic market is very dull, partly owing to the state of trade and partly to the prevailing view that prices are not yet by any means at the bottom. With one exception, the large colour works are finding full employment for their workpeople, but the greater part of the production is going into stock. A demand for an increase in wages was recently put forward by the workers, but the Central Wages Arbitration Commission in Berlin has disallowed the claim.

Chemical Matters in Parliament

British Dyestuffs Corporation

Sir R. Horne replying to Sir W. Barton (House of Commons-June 9) said that as stated in the Return of Government Investments presented in 1920 (No. 180), the Government holding in the British Dyestuffs Corporation consisted of 850,000 preferred shares, all fully paid. At current market quotations the value of these shares would amount to about £580,000, but in view of the existing depression in the textile industries and the consequent lack of demand for the Corporation's products, he did not think that current quotations could be regarded as affording any adequate indication of the ultimate value of the investment. He was informed that recent changes indicated that whilst substantial progress was being made in a task of great difficulty, the board of the company were not entirely satisfied with the position. The Government directors were in full accord with their colleagues as to the necessity of taking every possible measure to secure greater efficiency in the conduct of the undertaking, and steps had been taken to that end.

Captain W. Benn asked the President of the Board of Trade (House of Commons, June 13) if, in view of the preclusion of sales of dyes to users in China except through their agents there, he will say who are the agents; and whether the price that the British makers' agents sell at in the China market is less than that to our home users?

Mr. Baldwin: The agents in China of the British Dyestuffs Corporation (to whom I presume the question refers) are Messrs. Brunner Mond (China) Limited, Shanghai. As regards the second part of the question, I have already informed the hon. member that the Government is not responsible for the management of the corporation, and I cannot undertake to answer questions regarding their operations.

Mr. Baldwin, replying to Mr. Ormsby-Gore (House of Commons, June 13), said that the dividends on the Government investment in the British Dyestuffs Corporation, Limited, had hitherto been at the rate of 7 per cent. per annum on the non-cumulative preference shares and 8 per cent. per annum on the preferred ordinary shares, and the net amounts received to date were £43,424 10s. 6d. and £49,693 2s. 8d. respectively. He was unable to anticipate the dividends for future years.

German Reparation Act

Mr. Kiley asked the Prime Minister (House of Commons, June 13) whether he is aware that in numerous cases German exporters to this country are demanding repayment in full for their merchandise; whether, in such cases, the proceeds of the duty levied by His Majesty's Customs on the arrival of the goods are to be credited to the German Government; and, if so, whether it is intended to credit the German Government with the extra 9 per cent. duty which automatically becomes payable to His Majesty's Customs by British importers in consequence of this refusal of German subjects to send goods except under prepayment?

Mr. Baldwin: I am informed that this course is being adopted by exporters in certain cases, though as the German Government has undertaken to refund to them the equivalent in German currency of the amount collected under the Act, there is no pretext for such a demand. The amount payable to the Customs is in all cases 26 seventy-fourths of the amount paid in cash to the German exporter, and the whole amount paid to the Customs under the Act is credited to the German Government as part of the reparation payment.

Mr. Kiley asked the Prime Minister whether the policy of His Majesty's Government, in adhering to the arrangements whereby the 26 per cent. German reparation duty is collected by His Majesty's Customs in this country, is due to any misgiving as to the effectiveness of the arrangements of the German Government for collecting it as an export duty before the goods leave Germany; and, if so, whether he is aware that in practice it is resulting in British importers having to pay in numerous cases an equivalent of 35 per cent. Customs duty, and that this is particularly serious in so far as it affects the price of raw material for our own manufacturers?

Mr. Baldwin: As regards the first part of the question, I can only repeat that His Majesty's Government propose to continue the German Reparation (Recovery) Act in operation until the exact effect of the arrangements to be made by the German Government is known. At present we have no information as to the nature of the arrangements for collecting the export levy which they propose.

Mr. Kiley asked the Prime Minister approximately the cost to date of collecting the German reparations levy in this country?

Mr. Young: The general work of collecting the German reparations levy is merged in the ordinary duties of the Customs and Excise staff, and it is impossible to separate the cost of this one item of work from the rest. The permanent staff has not been increased since the work began, but some temporary clerical and legal assistance has been required, and has cost to date approximately £1,000.

Key Industries Bill

Mr. Chamberlain (House of Commons, June 13) moved the resolution whereby the debate on the Safeguarding of Industries Bill would be guillotined, and five days, two days, and one day respectively allotted to the Committee, report, and third-reading stages. Opposition to the proposal was led by Sir D. Maclean, and a motion was made by Mr. Hogge to confine its operation to the Committee stage, but was defeated by 219 to 59. Mr. Chamberlain, with a view to an agreement, offered to give an extra day to the Committee stage, but an amendment that 10 days should be allotted to it was pressed to a division, and was rejected by 215 to 51. Sir D. Maclean thereupon declared that the Opposition would move no further amendments, and Mr. Chamberlain's original motion was carried by 186 to 52.

Lead Paints

Lieut.-Colonel Sir J. Gilmour (for the First Commissioner of Works), replying to Mr. Hannon (House of Commons, June 13), said that in connection with the consideration by the Government of the general question of the prohibition of the use of lead paints, which was to be discussed at the International Labour Conference next October, the experience of the Office of Works with leadless paints was being carefully reviewed for the information of the Home Office, and he was not in a position at the present time to make any statement on the subject.

British Cellulose Company

Mr. Young, replying to Mr. Ormsby-Gore (House of Commons, June 13), said that the Government held 1,450,000 7½ per cent. "A" cumulative participating preference shares in the company. No dividend had been received thereon for the year 1920. There were two Government directors on the board, who received fees at the rate of £500 a year each.

Nauru Phosphates

Mr. Ormsby-Gore asked the President of the Board of Trade (House of Commons, June 13) what were the net receipts to date received on behalf of the Governments of Great Britain, Australia and New Zealand, respectively, from the sale of phosphate from the island of Nauru?

The Under-Secretary of State for the Colonies (Mr. E. Wood): I have at present no information on the subject. I will make inquiry of the British Phosphate Commissioners, and communicate the result.

At a meeting of the ROYAL SOCIETY to be held on Thursday, June 23, papers are expected to be submitted by E. F. Armstrong, F.R.S., and T. P. Hilditch on "A study of catalytic actions at solid surfaces (VI.)"; Sir J. B. Henderson, D.Sc., "A Contribution to the Thermodynamical Theory of Explosions" (Part I.), and (with Professor H. R. Hassé), Part II, (communicated by Sir J. A. Ewing, F.R.S.); S. Butterworth, "Eddy Current Losses in Cylindrical Conductors with special Applications to the Alternating Current Resistances of Short Coils" (communicated by Mr. F. E. Smith, F.R.S.); E. S. Bieler, "The Currents induced in a cable by the passage of a mass of magnetic material over it" (communicated by Sir Ernest Rutherford, F.R.S.); Guy Barlow, D.Sc., and H. B. Keene, D.Sc., "The Experimental Analysis of Sound in Air and Water: some Experiments towards a Sound Spectrum" (communicated by Sir Oliver Lodge, F.R.S.); Guy Barlow, D.Sc., "The theory of Analysis of an Electric Current by periodic Interruption" (communicated by Sir Oliver Lodge, F.R.S.).

From Week to Week

Dr. G. Rutter, deputy-director of research at the Royal Arsenal, Woolwich, has been appointed director of research in succession to Sir Robert Robertson.

Mr. J. H. SWALLOW, of Sackville & Swallow, Ltd., has been re-elected, for the third time, chairman of the Federation of Calico Printers.

Mr. William Alexander Smith, Taybank, Helensburgh, chairman of the British Chemical Co., Ltd., and his wife have just celebrated their golden wedding.

D. Wyllie and Co., Ayr Chemical Works, have been granted leave to erect buildings in Saltpans Road to be used as fertiliser works.

Mr. K. C. Browning has been appointed professor of chemistry and metallurgy at the Artillery College (formerly the Royal Ordnance College), Woolwich. Professor Browning was for 15 years Government Analyst in Ceylon.

The Gas Committee of Glasgow Corporation has accepted tenders from Fleming Brothers for ash hoppers for a new boiler at the Provan Chemical Works from Macfarlane, Strand & Co., Ltd., for cast-iron piping for purifiers at the Provan Chemical Works, and from Mr. John Buchanan for foundations and weigh-house at the Dalmarnock Chemical Works.

In the returns for May oil figures for the first time in the history of the trade of Swansea harbour. During the month no fewer than 33,260 tons of crude and other oils, representing six and a half million gallons, were landed by the Anglo-Persian Co.'s tank steamers at the new Swansea depots. There was an export also of 66,674 tons of oil for fuel and bunkers.

Anthony Durkin, of Huddersfield, a chemical worker in the employ of the British Dyestuffs Corporation, Ltd., was awarded in the County Court last week £3 10s. compensation for injuries which incapacitated him for two weeks. Durkin was assisting to charge a pan with nitric acid when the acid splashed into his left eye and caused injuries which had to be medically treated.

During a discussion at Carlisle City Council on Tuesday regarding the utilisation of Gretna munitions factory in order to lessen unemployment in the district, Mr. Patrick Kerr, who had attended a deputation to the Minister of Labour and War Office on behalf of Gretna workers, said the War Office had made up its mind to wash its hands of Gretna, and in all probability the factory would be handed over to the Disposals Board.

Mr. Edmund Page, an old pupil of Bromsgrove School, Birmingham, has presented the school with a well-equipped laboratory in memory of Mr. Charles Whitley, another old boy and intimate friend in later years, who was killed in the war. The new building, the formal opening of which was the principal feature of Commemoration Day on Tuesday, will be known as the "Charles Whitley Laboratory." It will be a great accession to the science side of the school, and will release the old laboratory, erected 25 years ago, for other uses.

At a meeting of Oxford University Convocation on Tuesday, a decree was unanimously passed, on the motion of the President of Magdalen, authorising the loan of a sum not exceeding £19,000 for the completion of the Dyson Perrins laboratory of organic chemistry. Sir Herbert Warren said he hoped the laboratory would be available for the University early in the autumn, and he considered that the statute creating the special reserve fund out of the residue of the emergency relief fund one of the most important, prudent, and opportune measures which had been proposed and adopted by Convocation.

At the seventy-fifth general meeting of the members of the Institution of Mining Engineers held on Thursday, June 9, at Burlington House, Sir John Cadman announced that as the result of discussions with the council of the Institution of Mining and Metallurgy, arrangements for closer co-operation between the two institutions had been agreed upon. There would be a joint secretariat and an amalgamation of staffs at the new offices of the Institution of Mining and Metallurgy in City-road. The chairman announced the nomination of Sir John Cadman as president of the institution for the year 1921-22.

Professor G. BARGER lectured on "COAL: ITS CHEMISTRY AND ECONOMIC IMPORTANCE," to the Edinburgh Branch of Workers' Educational Association, on Thursday, June 9. Professor Lorraine Smith presided. The lecturer said the sun was the source of energy for living beings, and the driving power of modern civilisation was the energy of the sun stored up long ago chiefly as coal. Statistics were quoted concerning the present consumption of coal for various purposes—domestic use, steam engines, iron and steel, gas works, &c. The chemical composition of coal and its combustion, together with the reverse process in plants, was also commented upon by the lecturer, principally for a better understanding of the economic importance of coal, and in conclusion he referred to the various by-products of the gas works, such as ammonia and coal tar, and the properties of aniline dyes, medicinal preparations, and other substances which are obtained from coal tar.

At the ordinary meeting of the Chemical Society, at Burlington House, Piccadilly, W. 1, on Wednesday, June 22, papers will be read on "High Temperature Phenomena of Tungsten Filaments," by C. J. Smithells (for G.E.C. Research Staff); "A Simple Apparatus for Determining the Coagulations Velocity of Gold Sols," by Emil Hatschek; "Variation of Surface Tension with Temperature," by Professor W. Porter; "The Influence of the Solvent upon Ionisation and the Accompanying Heat Effect," by S. M. Neale; and "The Potential of the Iodine Electrode and the Activity of the Iodine Ion at 25°C.," by A. McKeown. Mr. E. Kilburn Scott will give a demonstration of "The Transmission of Sounds by means of Rochelle Salt Crystals." A general discussion on "Catalysis, with Special Reference to Newer Theories of Chemical Action," will take place on September 28 next. During the afternoon session "Radiation Theory" will be discussed and the opening paper given by Professor J. Perrin (Paris). The evening session will deal with "Heterogeneous Reactions," and will be opened by Dr. Irving Langmuir (Schenectady, U.S.A.).

Commercial Education Conference

Opening Address of Professor Kirkaldy at Nottingham

THE first session of the Commercial Education Association's Conference was opened at Messrs. Boot's Station Street offices, Nottingham, on Wednesday, April 8. The Conference was welcomed by Mr. Boot on behalf of the firm, who, as is well known, take the strongest interest in the continued education of their employees.

Professor Kirkaldy, of University College, Nottingham, gave a short sketch of the development of University Faculties of Commerce in this country. The problem, which he had first studied under Sir William Ashley at Birmingham, was how to frame a curriculum for the business man which should have a standing equal to that of other university curricula. This had been found possible, since pure and applied economics could be studied so as to have a great influence on character. The study of languages was based on that of the respective literatures, and here the commerce student worked with the arts student. Equally on the science side, he did the same work as the science student, to the extent of one-third of his total study time.

Objections might be urged by the successful business man, who regarded his qualities as being inborn rather than a product of higher education. It was not sufficient now, however, as in the past, to work up from the bottom rung of a particular business. Every branch of business requires independent historical and theoretical study. The problems caused by the introduction of machinery, ill comprehended, had led to misery and troubles. The former acute currency troubles, and those due to violent fluctuations in the prices of raw materials, had all been partly overcome by more knowledge. There was need to develop special qualities in all the executive officers of industry; they must learn the history of the present relations of employer and employed, since seven-eighths of the labour troubles arose from ignorance on both sides. There were also social reasons for commercial education. The average business man was formerly, and is still to some extent, looked down on by the professional. This was not necessary. Business need not inevitably lead to fraud, as the old canon lawyers asserted and on the other hand, industries and commerce were necessary for progress and even civilisation

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AMINES. Optical investigations of the constitution of aromatic amines. H. Ley and G. Pfeiffer. *Ber.*, March 12, 1921, pp. 363-378.

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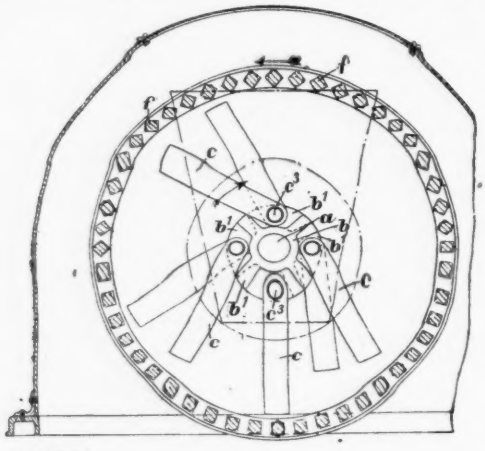
Patent Literature

Abstracts of Complete Specifications

163,064. GRINDING, CRUSHING OR DISINTEGRATING MACHINES. C. E. V. Hall, 26, Paradise Square, Sheffield. Application date, June 25, 1920.

A shaft *a* is provided wirh a boss *b* having a series of pockets b^1 around its circumference. One or more radial arms *c* are pivoted on pins at c^3 in each pocket, and are free to swing within the limits of the pocket. A circular cage of horizontal bars *f* is carried by a sleeve rotatively mounted on the shaft *a* so that the cage *f* and arms *c* may be rotated in opposite

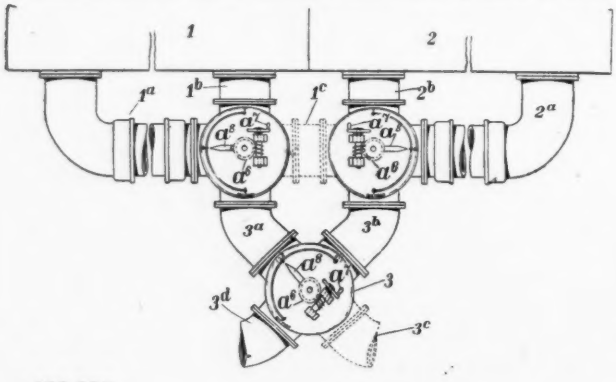


163,064

directions. The material to be ground is admitted through a central opening into the cage *f* and passes out between the peripheral bars when ground. The bars *f* are made of square or other non-circular cross section and each one may be rotated on its own axis and clamped in any desired position. When arranged as in the lower part of the illustration the material delivered is coarser than when the bars are arranged as in the upper part of the illustration.

163,095. GAS PURIFIERS. Firth Blakeley, Sons, Ltd., and W. Blakeley, 15, Park Row, Leeds. Application date, February 9, 1920.

Two purifier boxes are provided with reversing and by-pass valves for controlling the flow of gas so that it may be passed through them in either direction and either upwards or down-



163,095

wards. The purifiers 1, 2 are connected by pipes 1^a, 1^b and 2^a, 2^b respectively with their corresponding valves, which are themselves connected by a pipe 1^c. A third valve 3 is connected by pipes 3^a, 3^b with the other two valves. Each valve consists of an inverted cup arranged within a casing and having its inlet and outlet ports in the bottom and in the side. Each valve is rotated by a hand wheel a^7 through worm gearing a^6, and carries an indicating pointer a^8 which shows the position of the opening in the side of the cup. The main inlet and outlet pipes for the gas are shown at 3^c, 3^d respectively. The direction of the flow may be reversed in each purifier, the order in which the purifiers are connected may be reversed, or either purifier may be by-passed by different settings of the valves.

163,116. CRYSTALLISATION OF SOLUTIONS. F. Merz, 20, Via Jacopo Duranti, Vercelli, Italy. Application date, February 11, 1920.

The object is to facilitate the separation of crystals from the walls of the vessel in which crystallisation takes place. The vessel may be formed of a strip of flexible material such as india-rubber, supported by bars and passing over rollers at each end. The crystals are deposited on the flexible material and are detached by rotating one of the rollers, so that the portion of the vessel which was concave is deflected into a convex shape. In another form the vessel is formed by a bag of flexible material within a rigid basin which is mounted on horizontal trunnions. The crystals are detached by rotating the vessel into an inverted position so that the weight of the crystals causes the inversion of the flexible bag. Several other forms based on the same principle are also described.

163,137. ARTIFICIAL FERTILISERS. O. Silberrad, The Silberrad Research Laboratories, Buckhurst Hill, Essex. Application date, February 19, 1920.

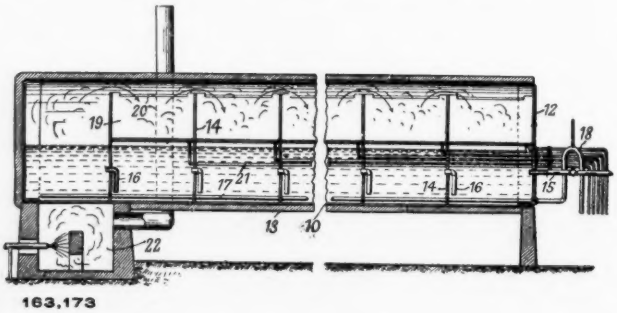
The object is the production of a granular product from the fertiliser "nitrolim" and the elimination of dust. 1,000 parts of "nitrolim" are mixed with 600 parts of waste liquor obtained in the manufacture of sulphite paper pulp and known as sulphite waste. The mixture is granulated and dried

163,162. AMMONIUM SALTS, PURIFICATION OF. G. B. Ellis, London. (From Foundation Oven Corporation, 233, Broadway, New York.) Application date, March 1, 1920.

The object is to purify crystallised ammonium salts such as the sulphate, nitrate, chloride, or oxalate, obtained by passing the ammonia vapour through the corresponding acid. Crude ammonia liquor, which is usually obtained in the same plant as the ammonium salts, contains as impurities solid matter such as carbon, organic matter such as tar, pyridine, phenol, cresol, acridine, &c., and inorganic ammonium salts such as the carbonate, chloride, cyanate, &c. This crude liquor is freed from solid matter and then treated with benzol or one of its homologues to dissolve the organic impurities. The solvent is then removed and the ammonia liquor used to wash the crystals of ammonium salt and neutralise the traces of acid which remain in it.

163,173. REFINING OIL OR THE LIKE BY DISTILLATION. J. G. P. Evans, Handley, Tex., U.S.A. Application date, March 9, 1920.

A horizontal cylindrical drum 10 is covered with heat



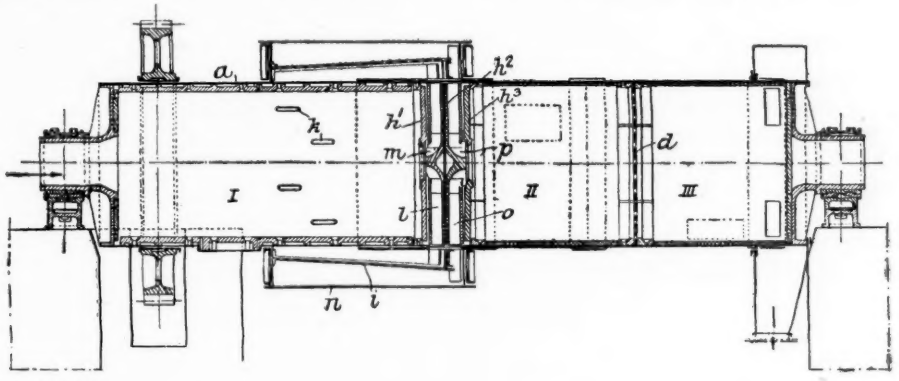
163,173

insulation 13 except at one end 12, and is divided by a number of traverse partitions 14. These partitions do not reach the top of the drum, so that a continuous passage is maintained

along the top. The oil is supplied by a pipe 15 passing through the end 12, and the various compartments are connected by pipes 16. The level of the oil is maintained by an overflow pipe 17 having a bent outlet 18. A condensing pan 19 is arranged longitudinally within the drum, just above the level of the oil, and is of V-shape in cross section, the side walls being formed by radial plates. Each compartment thus formed communicates with the longitudinal vapour space in the drum by means of slots 20 which are cut in the upper edges of the two side walls 19. Each compartment is provided with an outlet pipe 21 for the condensate which passes through all the compartments to the rear of the drum. A furnace 22 is arranged under the first compartment only, and the temperature in each succeeding compartment decreases towards the other end of the drum. Vaporisation takes place in each section and condensation takes place in each condensing compartment at the corresponding temperature. The hot condensate from each passes through the pipe 21 and gives up its heat to the cooler oil in the succeeding compartments. It is found that all the distillates collected from the pipes 21 are clean or "sweet," and no subsequent purification is necessary.

163,199. DISTILLATION OF COAL TAR, BLAST FURNACE TAR AND LIKE TARS, AND TREATMENT OF THE RESIDUAL PITCHES. H. Tindale, "Eilla," Altona Street, Abbotsford near Sydney, N.S.W., Australia. Application date, April 20, 1920.

The process is for the distillation of low temperature tars, blast furnace tars, vertical and horizontal retort tars, and producer gas and similar tars. Coal tars may be resolved into four main constituents, *i.e.*, oils boiling up to 300°C., free carbon, petrolenes and asphaltenes, the last three being contained in the pitch. The object is to treat the tar so that the resulting pitch contains any desired proportion of petrolene and asphaltene. The tar is dehydrated, and then passed into a still which is connected to a condenser, and lagged in such a way that distillates are not returned to the still. A steam coil is arranged above the furnace and superheated steam is passed through the tar while under distillation. The temperature is kept below 300°C., and the distillation is continued until the oils are removed, and the asphaltenes and petrolenes have reached the required proportions. Removal of the oils may be facilitated by distilling under a partial vacuum. The percentage of asphaltenes may be increased by blowing air through the tar for 2-24 hours, according to the amount previously present, and the consistency of the product desired.



161,977

NOTE.—The following specifications, which are now accepted, were abstracted in THE CHEMICAL AGE when they became open to inspection under the International Convention: 139,159 (Koppers Co.), relating to purification of liquids, see Vol. II., page 479; 140,061 (L. Duparc and C. Urfer), relating to a process for the production of catalysts, see Vol. II., page 562; 143,545 (E. M. Sawtelle), relating to destructive distillation of wood, see Vol. III., page 162; 145,060 (Badische Anilin & Soda Fabrik), relating to manufacture of urea, see Vol. III., page 243; 155,792 (Electrolytic Zinc Co. of Australasia Proprietary, Ltd.), relating to recovery of zinc by electrolysis, see Vol. IV., page 281.

International Specifications not yet Accepted

161,924. METHANE. Farbwerke vorm. Meister Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, April 15, 1920. Addition to 146,110.

Specification 146,110 describes a process for producing methane in which a mixture of carbon monoxide and hydrogen is passed over a catalyst, such as pumice, containing active nickel. This process is now modified by diluting the mixture with an inert gas to regulate the temperature. An excess of hydrogen may be employed as the inert gas, or methane, may be allowed to accumulate by passing the mixture repeatedly through a single contact apparatus. Some methane and water vapour are extracted after each passage, and are replaced by an equivalent amount of hydrogen and carbon monoxide, to maintain the proportions of carbon monoxide and hydrogen at about 1 : 5.

161,976. PURIFYING WASTE LIQUIDS. Koppers Co., Union Arcade Building, Fifth Avenue, Pittsburg, Pa., U.S.A. (Assignees of R. L. Brown, Wellon Institute, Pittsburgh, Pa., U.S.A.). International Convention date, April 20, 1920.

Waste liquor from ammonia stills, which contains phenol, is filtered through humus material such as peat, mixed with coke to maintain aeration, and inoculated with micro-organisms which destroy phenol. The liquor may be subjected to a preliminary treatment by settling, filtering through blast furnace slag containing iron oxide, and removing cyanogen compounds. The liquor is diluted and raised to 20°C.-25°C. before passing through the filter. The inoculation of the filter is effected by passing activated sewage sludge through it.

161,977. GRINDING AND CRUSHING. M. J. Davidsen, 5, Rue Fenelon, Paris. International Convention date, April 22, 1920.

Material is passed into the compartment *I* of a rotary drum *a*, which contains metal shot, then into the compartment *II.*, which contains metal balls, and finally into the compartment *III.*, which contains small metal rods, where it is ground to an impalpable powder. The material passes from the compartment *I.* through openings *k* to a sieve *i*, secured to the drum *a*. The coarser material passes by passages *l*, *m*, back to the compartment *I.*, and the finer material passes through the screen to the casing *n*, and thence by passages *o*, *p* to the compartment *II.* A similar screening device may be provided in place of the screen *d*.

LATEST NOTIFICATIONS

164,014. Apparatus for the separating of suspended bodies from electrical insulating fluids, more particularly gaseous fluids. Moller, E. July 31, 1914.

164,301. Combustion chamber for heating-installation using powdered solid fuels. Soc. D'Utilisation Des Combustibles Pulvérisés. June 4, 1920.

164,302. Manufacture of borneol. Fabriques De Produits Chimiques De Thann et De Mulhouse. May 28, 1920.

164,306. Manufacture of iodine or like compounds. Benkö R. June 1, 1920.

164,325. Method for purification of hydrocarbons. Treneer, J. M., and Benjamin, C. S. June 4, 1920.

164,329. Process for the manufacture of sugar from wood and other cellulose-containing substances. Classen, A. June 4, 1920.
164,335. Ammonia-soda process. Jourdan, F. June 3, 1920.
164,341. Apparatus for moulding soap. American Cotton Oil Co., June 5, 1920.

Specifications Accepted with date of Application

140,089. Exothermic chemical reactions under high temperatures and pressures, Apparatus for use in carrying out. Soc. L'Air Liquide, Soc. Anon pour L'Etude et l'Exploitation des Procedes G. Claude. December 24, 1918.
142,493. Lixiviating granular or pulverulent material, Apparatus for G. Grondal. April 29, 1920. Addition to 137,930.
143,918. Analysing gas mixtures, Apparatus for use in connection with. Svenska Aktiebolaget Mono. May 28, 1919.
144,659. Ammonia, Process for transforming—into a salt for use as a fertiliser. Badische Anilin & Soda-Fabrik. July 10, 1915.
144,681. Tetra-substituted ureas, Process of producing. E. I. Du Pont de Nemours & Co. September 11, 1918.
147,231. Coke Ovens. C. Otto & Co. Ges. January 3, 1916.
147,534. Artificial tanning substances Process for the manufacture of. M. Melamid. July 15, 1919. Addition to 137,323.
148,784. Nitrogen contained in fuel, Recovery of. A. Riedel, July 16, 1917.
163,793. Evaporation or distilling apparatus. N. Testrup and Techno-Chemical Laboratories, Ltd. February 24, 1920.
163,856. Pulverising machines. A. M. Read. March 19, 1920.
163,874. Mercury compounds of glucosides, Manufacture of. O. Imray. (*Society of Chemical Industry in Basle.*) April 6, 1920.
163,877. Alkali silicates, Manufacture of readily soluble. F. J. Phillips. April 9, 1920.
163,900. Gas-producer conduits. R. C. Metcalfe. May 6, 1920.
163,937. Crude lactose or milk sugar, Method for the purification of. J. Tarrogues, J. W. Roche and G. Martin. July 22, 1920.
163,964. Purifiers, condensers and the like, Means for reversing the flow of gas in. Firth, Blakeley, Sons & Co., and W. Blakeley. November 15, 1919.

Applications for Patents

Badische Anilin- & Soda-Fabrik. Production of oxalic acid. 15,732. June 7.
Cammell, Laird & Co., Ltd. Cementation of iron, steel and ferrous alloys. 15,655. June 7.
Chemical & Metallurgical Corporation, Ltd. Treatment of argentiferous lead-zinc sulphide ores. 15,815. June 8.
Craig, E. N., and Durelco, Ltd. Electrolytic treatment of metalliferous materials containing tungsten or molybdenum. 16,148. June 11.
Darrasse E. & L., and Dupont, L. Manufacture of synthetic camphor. 15,601. June 6. (France, June 9, 1920).
Dreyfus, H. Treatment of products of cellulose derivatives. 15,931. June 9.
Dutt, E. E., & Godfrey, S. H. Process for manufacture of pigments from titaniferous bauxites. 16,063. June 10.
,, Process for extraction of titanium dioxide from titaniferous laterites. 16,064. June 10.
Elmore, F. E. Treatment of argentiferous lead-zinc sulphide ores. 15,815. June 8.
Fitzgerald, F. W. V. Manufacture of substitute for vulcanite, horn, shellac, &c., from blood. 16,112. June 11.
Girou, C. B. & Lefevre, A. Extraction of iodine from sea-weeds or ashes thereof. 15,969. June 9.
Imray, O. Y. (Soc. of Chemical Industry in Basle.) Manufacture of dialkylamides of nicotinic acid or their derivatives or substitution products. 15,730. June 7.
Jones, R. O. Manufacture of caustic soda. 16,164. June 11.
Knuepffer, M., & Pezold, P. (Moser & Pezold.) Process for manufacture of sugar from wood, peat, &c. 15,666. June 7.
Levitt, E. Process for treating silicates. 15,894. June 9.
Maypole Margarine Works, Ltd., & Michelin, O. Manufacture of margarine. 15,856. June 8.
Pearson, R. E. Electrolytic treatment of metalliferous materials containing tungsten or molybdenum. 16,148. June 11.
Perkins, W. G. Treatment of ores containing copper silicate. 15,968. June 9.
Perry, W. P. Method of converting cellulosic and ligneous materials into sugar. 15,689. June 7.
Picard, H. F. K. Treatment of ores containing copper silicate. 15,968. June 9.
Poore, P. Destructive distillation of wood, woody fibres, &c. 16,069. June 10.
Rider, D. Distillation of tar. 15,726. June 7.
Robinson, E. & M. Producing gas or vaporised oil from petroleum, &c., for heating. 16,029. June 10.
Soc. of Chemical Industry in Basle. Manufacture of dialkylamides of nicotinic acid or their derivatives or substitution products. 15,730. June 7.
,, Manufacture of resins. 15,942. June 9.
Sulman, H. L. Treatment of ores containing copper silicate. 15,968 June 9.
Taplin, T. J. Treatment of ores containing copper silicate. 15,968. June 9.
Techno-Chemical Laboratories, Ltd. Refrigeration. 15,701. June 7.
Thermal Industrial & Chemical (T.I.C.) Research Co., Ltd. Method of removing liquid from surface of molten metal. 15,725. June 7.
Tisdall, C. A. Fertilisers. 15,694. June 7.
Tyrer, D. Manufacture of red oxide of iron. 15,813, 15,814. June 8.
Wilson, A. H. Process for manufacture of pigments from titaniferous bauxites. 16,063. June 10.
,, Process for extraction of titanium dioxide from titaniferous laterites. 16,064. June 10.

United States Patents

THE United States Patent Office announces that "the laws of the United Kingdom of Great Britain and Ireland are recognised as affording to citizens of the United States privileges substantially reciprocal to the privileges accorded by the 'Nolan' Act of March 3, 1921 (H.R. 15662), and that consequently all the privileges specified in said Act will be extended to its subjects, subject to a limitation of the term under Section 2 of the Act as construed in *Ex parte* Hackett (285 O.G. 795)."

The "Nolan" Act was approved on March 4, 1921, and provides for the temporary extension of the time for filing patent applications or taking actions in the United States Patent Office, and for reviving or reinstating applications. The Act extends until March 3, 1922 (under conditions of reciprocity), the time for taking any action on a patent application which time had not expired on August 1, 1914, or which commenced after that date. The decision on Section 2 of the Act in *Ex parte* Hackett referred to above is one which defines the conditions under which action may be taken under the Act by subjects of a foreign country (*e.g.*, the United Kingdom).

Any inventor or owner of a British patent who may contemplate applying for protection in the United States with priority of date under the International Convention (which may extend as far back as August 1, 1914) should take note of this announcement.

Patents Court Cases

NOTICE has been given of an application under Section 24 of the Patents and Designs Acts, 1907 and 1919, for the following patent to be indorsed "Licence of Right":—116,495 (Norsk Hydro-Elektrisk Kvaelstofaktieselskab), relating to the manufacture of nitric acid. Any notice of opposition must be given by July 15, 1921.

The Chemical Section of the Manchester Literary and Philosophical Society recently considered how best the results of chemical research might be protected by patents, and Mr. Harold E. Potts said that if the patent agent studied the subject so that he could freely and intelligently criticise the research programme the requirements of the law could be met and research at one and the same time be assisted.

Addressing the Cardiff Rotary Club on Monday on "The British Science Guild," Dr. W. Evans Hoyle, director of the Welsh National Museum, said that, though the recent war could not have been won without the services rendered to the country by men of science, science nevertheless had not attained its rightful place in the public estimation. As proof of this assertion, he instanced the recent honours list, which contained the names of only two men of recognised position in the scientific world, and in the case of one of these it was doubtful whether he would have been selected if he had not held an important medical office in a Government department. More than that, although ten honorary degrees were conferred last week on the occasion of the Prince of Wales's installation as Chancellor of the University of Wales, not one of the degrees fell to a representative of any branch of science.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to* THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

Market Report

THURSDAY, June 16, 1921.

Owing to the improved industrial outlook rather more confidence has been shown by buyers during the past week, and there has been a larger inquiry, with certain amount of business passing.

The export trade has also been rather better in a number of directions.

General Chemicals

ACETONE.—The position is firmer, with active export inquiry.

ACID ACETIC.—Rather more business has been done at recent prices.

ACID CITRIC remains a firm market.

ACID FORMIC.—A little more interest has been shown in this product, but only a small business is so far reported.

ACID LACTIC.—Unchanged.

ACID TARTARIC is slow, and the tendency favours buyers.

BARIUM CHLORIDE is still lower in price; foreign competition is keen.

BLEACHING POWDER remains featureless.

COPPER SULPHATE is still very slow and easy in tone.

FORMALDEHYDE is rather better. The business is, however, confined to hand-to-mouth orders, and stocks are now thought to be small.

LEAD ACETATE.—There is nothing doing.

LEAD NITRATE is not inquired for; price nominally unchanged.

POTASH BICHROMATE is in very poor demand, and the market is again weaker.

POTASH CARBONATE is freely offered, and within limits buyers can practically name their own price.

CAUSTIC POTASH is a very small market, and the article still exhibits a drooping tendency.

POTASH PERMANGANATE is lower in price for forward delivery, but stocks are small.

POTASH PRUSSIATE is very firm, the limited stocks being in strong hands.

SODA ACETATE is weaker in tendency; little business reported.

SODA BICHROMATE.—This article remains practically a dead letter, but there are signs of a revival in the immediate future.

SODA CAUSTIC is dull and slow of sale.

SODA HYPOSULPHITE.—There is no change to report.

SODA NITRITE is very quiet, but the price is fully maintained.

SODA PHOSPHATE remains uninteresting.

SODA PRUSSIATE is in constant inquiry on export account, and a further advance in price is not unlikely.

SODA SULPHIDE is offered at very low prices from the Continent, and a limited business is reported on export account.

Coal Tar Intermediates

In anticipation of a prompt settlement of the coal dispute a fair number of inquiries both on home and export account have been received, and a few orders have been booked for delivery as early as possible after the re-opening of the works.

ALPHA NAPHTHYLAMINE is without change in price and stocks are gradually passing into consumption.

ANILINE OIL AND SALT.—A considerable inquiry has been received for Aniline oil and orders have been placed at recent figures.

BETA NAPHTHOL is without any visible change.

DIMETHYLANILINE is only in very small demand.

NITROBENZOL.—Orders have been received for limited quantities, but the demand is not heavy.

PARANITRANILINE remains lifeless.

RESORCIN is in slightly better request.

SALICYLIC ACID maintains its upward tendency.

Coal Tar Products

There is little change in the situation, so far as coal tar products are concerned, from last week. Owing to the continued coal strike supplies remain scarce.

90 PER CENT. BENZOL is difficult to obtain and is worth from 2s. 9d. to 2s. 10d. per gallon on rails.

PURE BENZOL is quoted at 3s. to 3s. 2d.

CREOSOTE OIL is scarce for prompt delivery, and is quoted at 8½d. per gallon in the North, and the price in the South is in the region of 10d.

CRESYLIC ACID is in somewhat better demand, the price for Pale 97/99 per cent. being about 2s. 3d. on rails, and for dark about 2s.

SOLVENT NAPHTHA is quoted at 2s. 6d. per gallon on rails.

HEAVY NAPHTHA is worth 2s. 4d.

NAPHTHALENE is inactive and is quoted at from £9 to £12 per ton for the crude qualities, and from £18 to £23 for refined.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	3	to	0	2	6
Acetone oil	ton	95	0	0	to	100	0	0
Acetone, pure	ton	105	0	0	to	110	0	0
Acid, Acetic, glacial, 99-100%	ton	65	0	0	to	67	10	0
Acetic, 80% pure	ton	53	0	0	to	54	0	0
Arsenic	ton	100	0	0	to	105	0	0
Boric, cryst	ton	69	0	0	to	70	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6½	to	0	0	7
Citric	lb.	0	2	7	to	0	2	9
Formic, 80%	ton	72	10	0	to	75	0	0
Gallic, pure	lb.	0	4	0	to	0	4	3
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	35	0	0	to	37	10	0
Lactic, 60 vol.	ton	40	0	0	to	42	10	0
Nitric, 80 Tw.	ton	41	0	0	to	44	0	0
Oxalic	lb.	0	0	9½	to	0	0	10
Phosphoric, 1.5	ton	55	0	0	to	57	0	0
Pyrogallic, cryst	lb.	0	7	9	to	0	8	0
Salicylic, Technical	lb.	0	1	0	to	0	1	2
Salicylic, B.P.	lb	0	1	5	to	0	1	6
Sulphuric, 92-93%	ton	8	10	0	to	8	15	0
Tannic, commercial	lb.	0	3	6	to	0	3	9
Tartaric	lb.	0	1	8	to	0	1	9
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	37	10	0	to	40	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17-18%	ton	15	0	0	to	16	0	0
Ammonia, anhydrous	lb.	0	2	2	to	0	2	4
Ammonia, .880	ton	43	0	0	to	45	0	0
Ammonia, .920	ton	30	0	0	to	32	10	0
Ammonia, carbonate	lb.	0	0	4	to		—	
Ammonia, chloride	ton	65	0	0	to	70	0	0
Ammonia, muriate (galvanisers)	ton	50	0	0	to	52	0	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	95	0	0	to	100	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	420	0	0	to	425	0	3
Arsenic, white, powdered	ton	52	0	0	to	55	0	0
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	19	0	0	to	20	0	0
Nitrate	ton	50	0	0	to	52	0	0
Barium Sulphate, blanc fixe, dry	ton	30	0	0	to	31	0	0
Sulphate, blanc fixe, pulp	ton	16	10	0	to	17	0	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	18	0	0	to	19	0	0

	per	£	s.	d.		£	s.	d.
Borax crystals	ton	34	0	0	to	36	0	0
Calcium acetate, Brown	ton	12	0	0	to	13	0	0
,, Grey	ton	19	0	0	to	21	0	0
Calcium Carbide	ton	29	0	0	to	30	0	0
Chloride	ton	12	10	0	to	13	0	0
Carbon bisulphide	ton	65	0	0	to	67	0	0
Casein, technical	ton	90	0	0	to	92	0	0
Cerium oxalate	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	2	to	0	1	4
Cobalt acetate	lb.	0	11	6	to	0	12	6
Oxide, black	lb.	0	16	0	to		—	
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	35	0	0	to	37	0	0
Cream Tartar, 98-100%	ton	130	0	0	to	135	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol.	ton	95	0	0	to	97	10	0
Formusol (Rongalite)	lb.	0	4	9	to	0	5	1
Glauber salts, commercial	ton	6	0	0	to	7	0	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	45	0	0	to	50	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	50	0	0	to	52	0	0
Carbonate (White Lead)	ton	43	0	0	to	46	0	0
Nitrate	ton	55	0	0	to	57	0	0
Litharge	ton	38	10	0	to	40	0	0
Lithopone, 30%	ton	30	0	0	to	32	10	0
Magnesium chloride	ton	18	0	0	to	19	0	0
Carbonate, light	cwt.	2	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	10	10	0	to	11	10	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	75	0	0	to	78	0	0
Methyl acetone	ton	95	0	0	to	100	0	0
Alcohol, 1% acetone	ton	145	0	0	to	150	0	0
Nickel sulphate, single salt	ton	60	0	0	to	62	0	0
Nickel ammonium sulphate, double salt	ton	62	0	0	to	64	0	0
Potash, Caustic	ton	35	0	0	to	37	10	0
Potassium bichromate	lb.	0	0	9½	to		—	
Carbonate, 90%	ton	40	0	0	to	42	10	0
Chloride	ton	38	0	0	to	40	0	0
Chlorate	lb.	0	0	8½	to	0	0	9
Meta bisulphite, 50-52%	ton	130	0	0	to	140	0	0
Nitrate, refined	ton	50	0	0	to	52	0	0
Permanganate	lb.	0	1	9	to	0	1	10
Prussiate, red	lb.	0	2	6	to	0	2	9
Prussiate, yellow	lb.	0	1	3	to	0	1	4
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt.	3	15	0	to		—	
Seconds	cwt.	3	10	0	to		—	
Sodium acetate	ton	30	0	0	to	32	0	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	7	to	0	0	7½
Bisulphite, 60-62%	ton	35	0	0	to	37	10	0
Chlorate	lb.	0	0	5½	to	0	0	5½
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	15	0	0	to	16	0	0
Nitrite, 96-98%	ton	45	0	0	to	46	0	0
Phosphate, crystal	ton	25	0	0	to	27	0	0
Perborate	lb.	0	1	9	to	0	2	0
Prussiate	lb.	0	0	8	to	0	0	8½
Sodium Sulphide, crystals	ton	19	0	0	to	20	0	0
Sulphide, solid, 60-62%	ton	26	0	0	to	30	0	0
Sulphite, cryst.	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	85	0	0	to	90	0	0
Strontium Nitrate	ton	84	0	0	to	90	0	0
Strontium Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	19	0	0	to	19	10	0
Roll	ton	19	0	0	to	19	10	0
Tartar emetic	lb.	0	2	3	to	0	2	6
Tin perchloride, 33%	lb.	0	2	6	to	0	2	7
Tin Perchloride, solid	lb.	0	3	0	to	0	3	3
Protochloride (tin crystals)	lb.	0	1	8	to	0	1	9
Zinc chloride, 102 Tw.	ton	22	0	0	to	23	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0
Oxide, 99%	ton	45	0	0	to	47	10	0
Dust, 90%	ton	90	0	0	to	92	10	0
Sulphate	ton	21	10	0	to	23	10	0

Coal Tar Intermediates, &c.

	per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	4	0	to	0	4	3
Alphanaphthol, refined	lb.	0	4	6	to	0	4	9
Alphanaphthylamine	lb.	0	3	0	to	0	3	3
Aniline oil, drums extra	lb.	0	1	7	to	0	1	8
Aniline salts	lb.	0	1	8	to	0	1	10
Anthracene, 85-90%	lb.		—		to		—	
Benzaldehyde (free of chlorine)	lb.	0	4	9	to	0	5	0
Benzidine, base	lb.	0	8	6	to	0	9	0
Benzidine, sulphate	lb.	0	9	0	to	0	9	6
Benzoic acid	lb.	0	2	3	to	0	2	6
Benzoate of soda	lb	0	2	3	to	0	2	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	8	0	to	0	8	6
Betanaphthol	lb.	0	2	9	to	0	3	0
Betanaphthylamine, technical	lb	0	9	6	to	0	10	0
Croceine Acid, 100% basis	lb	0	5	0	to	0	6	3
Dichlorbenzol	lb	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	0
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	6	to	0	1	8
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	3	0	to	0	3	3
Dimethylaniline	lb	0	4	0	to	0	4	3
Diphenylamine	lb	0	4	6	to	0	4	9
H-Acid	lb.	0	10	0	to	0	10	6
Metaphenylenediamine	lb.	0	5	9	to	0	6	0
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	0
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthionic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	5	0	to	0	5	6
Nitronaphthalene	lb.	0	1	5	to	0	1	6
Nitrotoluol	lb.	0	1	4	to	0	1	5
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	12	6	to	0	13	0
Para-amidophenol, hydrochlor	lb	0	13	0	to	0	13	6
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	3	to	0	4	6
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	13	6	to	0	14	6
Paratoluidine	lb.	0	7	6	to	0	8	0
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	7	6	to	0	8	0
Resorcin, pure	lb.	0	8	6	to	0	9	0
Salol	lb	0	3	0	to	0	3	3
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	8	6	to	0	10	0
Tolidine, mixture	lb.	0	2	9	to	0	3	0

Lautaro Nitrate Co.

The Position in Chili

SPEAKING at the thirty-third annual general meeting of the Lautaro Nitrate Co., Ltd., Mr. J. O. Herrera (the chairman) referred to the future prospects of the company.

Unfortunately, he said, the present and future position was causing them grave concern, although they were in a much better position than most of the dealers in nitrate, and they had every hope of getting rid of part of their 40,000 tons of nitrate already arrived on this side, and still to participate this year in any quota of shipments based on the sales of nitrate by the Asociacion de Productores of which all the English companies were members, and which Asociacion represented fully 95 per cent. of the total production.

The trading results for this year would depend solely on the price obtained for the above 40,000 tons of unsold nitrate, in which the company had a participation of 75 per cent. over the cost price, and what quota of sale or shipments they might receive from the Asociacion de Productores.

Although the consuming season was not yet at an end, it was quite evident that very large stocks of nitrate at high prices would have to be carried over till the end of the present year, and even into the next year, and consequently the importers accustomed to make purchases of nitrate from the producing companies during the shipping period, July and March, did not feel inclined to enter into further commitments. There was, however, a greater contingency to be considered, and that was the position of the Chilean Government, which relied on its nitrate shipments for the greater part of its revenue, and this led the directors to think that something must be done to arrive at a continuance of shipments of nitrate to the consuming markets.

Company News

BRITISH PLATINUM & GOLD CORPORATION.—A circular issued to the shareholders states that the production of platinum and gold shows a steady increase.

BLEACHERS' ASSOCIATION.—A dividend is recommended at the rate of 12 per cent. for the half-year ended March 31, making 10 per cent. for the year. A sum of £100,010 (against £150,000) is carried to general reserve, and £337,890 is carried forward. The total dividend for the previous year was 15 per cent., and in addition a bonus of 5 per cent. was paid.

YORKSHIRE DYEWARE AND CHEMICAL.—The net profit for the year ended March 31 was £16,038, while £8,476 was brought forward. A dividend of 12½ per cent. is proposed, making 15 per cent. for the year, less tax, and £8,765 is carried forward. For the nine months ended March 31, 1920, the net profit was £45,525. The sum of £10,000 was placed to reserve, £20,000 to special reserve, and a dividend of 20 per cent., less tax, was paid.

JUTE INDUSTRIES (LTD.), have offered to acquire the 6 per cent. cumulative preference shares of Gilroy, Sons, & Co. (Limited). They propose to exchange eight 9 per cent. cumulative preference shares of the former company for each £10 share of the latter. The share capital is £300,000, of which £175,000 is in ordinary and £125,000 in preference shares, and all have been issued and paid up. The ordinary shares are held by Jute Industries (Limited).

BARRENECHEA NITRATE.—For the year 1920, after providing for the bonus on the five-year notes, corporation profits tax, and administration expenses, the net profit is £33,090. Further dividend of 35 per cent., less tax, making 50 per cent. for year. The officina was closed at the end of March last, owing to the large accumulation of unsold stocks in the consuming markets. Meeting, Baltic House, 27, Leadenhall-Street, E.C., June 23, at 12.30.

BRITISH-BROKEN HILL PROPRIETARY.—The report for 1920 states that after charging all administration expenses, allowing for depreciation, and making provision for income-tax and war profits tax in England and Australia, a loss is shown of £47,758. Deducting this from the credit balance brought in, there remains £122,903 to the credit of profit and loss. The liquid assets, including investments, mine products, and stores at cost, and deducting liabilities, amounted on December 31 last to £218,303. Meeting Winchester House, June 23, at 12.15.

SOCIETE FRANCAISE DE PETROLE.—The report to March 31 last states that at the last general meeting the chairman reported that the shareholders, notwithstanding the d'Arcy Co.'s decision not to exercise its option, had expressed their desire, by a postal vote, that the company be kept in being, in the hope that other parties might be found to deal with the property. Since that date the directors have endeavoured to dispose of the property, but without success up to the present. In the meantime payment of the consession rents in West Africa is being continued. Meeting, Finsbury Pavement House, E.C., June 21, noon.

ANGELA NITRATE.—The gross profit for 1920 amounted to £41,765, against £8,220. After deducting London expenses £2,401, income-tax £7,842, depreciation £425, and stoppage of works, expenses and repairs £10,092, there remains £21,004, to which is added £2,174 brought forward. The interim dividend of 10 per cent. absorbed £7,000, and a further dividend of 10 per cent. is proposed, making 20 per cent. for the year, against 10 per cent. A sum of £5,000 is transferred to reserve (the same), £977 is written off for depreciation of grounds, and a similar sum for depreciation of plant and machinery, leaving £2,223 to be carried forward.

NEW TRANSVAAL CHEMICAL CO.—At the annual general meeting on Tuesday, resolutions were adopted providing for the following dividends for the year ended June 30, 1920: First preference shares, 6 per cent.; "A" preference shares, 8 per cent.; ordinary, 17½ per cent. The chairman (Baron E. B D'Erlanger) described the balance sheet as what the Americans would call a "lovely" balance sheet. The strength of the company's position was shown by the fact that the quick assets at June 30, 1920, considerably exceeded the quick liabilities, and that the fixed assets stood in the books at a figure far below that at which they could be replaced to-day.

SALAR DEL CARMEN NITRATE SYNDICATE.—At the annual general meeting on Thursday, July 9, the chairman (Sir H. W. Sillem) said it was proposed to apply the available balance of £46,715 in paying a final dividend of 15 per cent., less tax, making 20 per cent. for the year, transferring £10,000 to reserve, and allocating £5,000 to reduction of plant and machinery account, leaving £8,615 to be carried forward to 1921. The company's grounds continued to yield high quality material, of which there were ample deposits for many years. With regard to the nitrate business in general, it was clear that consumption for the year to June 30 would fall considerably short of expectations. The industry was in one of its periodical difficulties, and some time and ingenuity might be required to extricate it from its troubles. Personally he thought that the position should be normal by this time next year.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Vancouver ...	Druggists' sundries. Replies to the Canadian Government Trade Commissioner's Office, Portland House, 73, Basinghall Street, London, E.C.2.	—
Egypt ...	Artificial silk	703
Cape Town ...	Glassware	705
Serb-Croat-Slovene State	Disinfectants; pink chloride powder; creosote, &c. Replies to the E. Ronomsko Odelenje Ministarstva Saobracaja.	—
Hamilton, Bermuda ...	Glassware	716
Port of Spain	Soaps	717
Port of Spain	Glassware	718
Budapesth ...	Vegetable and animal raw materials.	729
Sweden ...	Chemicals used in wood-pulp, paper and other industries.	734
Turin ...	Varnishes	730

Tariff Changes

FRANCE.—The export of extracted fats, oil, &c., is now permitted without special authorisation, until further notice.

JAPAN.—Full particulars appear in the Board of Trade Journal (May 19, pp. 567-8), of forthcoming amendments to the Japanese Customs Tariff. Alterations are made in the import duties on stearin; olein; paraffin wax; caustic soda and caustic potash, unrefined; soda ash and natural soda; peroxide of soda; potassium cocaine; and hydrochloride of cocaine. Catalysers containing platinum or platinum salts, and articles made of coal tar, pitch and asphalt for repairing roads will be admitted free of duty.

NIGERIA.—The importation by letter or parcel post of distilling apparatus, and dyestuffs from Germany is prohibited.

POLAND.—Zinc (in pigs, scrap, powder, slag or dust) may now be exported without licence.

PORTUGAL.—The exportation and re-exportation of olive oil, lard, leather or skins is now permitted without the necessity of a licence.

SAN SALVADOR.—The import duty on gasoline and gasolene oil is reduced to 1½ centavos (gold) per kilog.

Recent Wills

Dr. W. ODLING, F.R.S., Ph.D., of Norham Gardens, Oxford, for 40 years Waynflete Professor of Chemistry at Oxford, President of the Chemical Society in 1873, and Fullerian Professor of Chemistry at the Royal Institution in 1868 ..... £47,587

Dr. A. W. Blyth, public analyst for the County of Devon, Auct. for the borough of Marylebone, of Kentbury, Berks, and Upper Gloucester Place, London, W. £23,229

Mr. J. Booth, of Mill Hill, Pontefract, Yorks, chemical manure manufacturer £27,698

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Bankruptcy Information

THOMPSON, J., residing at 35, Northern Grove, West Didsbury, Lancaster, and lately carrying on business as The Thompson Chemical Co., 105, George Street, Manchester, Lancaster, chemical manufacturer. Court, Manchester. Receiving Order June 6, 1921. No. of Receiving Order, 38. Creditors' petition.

First Meetings and Public Examinations

BROOKS, T. C. (trading as R. Cheetham & Co.), 25 and 54, George Street, and 4, Chorlton Street, Manchester, Lancaster, chemist and analyst. Court, Manchester. First meeting, June 21, 1921, at 3 p.m. Official Receiver's Offices, Byrom Street, Manchester. Public examination, July 8, 1921, at 10 a.m., Court House, Quay Street, Manchester.

STOPFORTH, R. (trading as Rowand & Co.), residing at 59, Kimberley Drive, Crosby, Lancaster, carrying on business at 10, Eaton Street, Liverpool, and lately carrying on business at 71, Vauxhall Road, Liverpool, wholesale druggist. Court, Liverpool. No. of matter, 74 of 1921. First meeting, June 21, 1921, at 11.30 a.m., Offices of the Official Receiver, 11, Dale Street, Liverpool. Public examination, July 11, 1921, at 11 a.m., the Court House, Government Buildings, Victoria Street, Liverpool.

Company Winding Up

CORNBROOK CHEMICAL CO., LTD.—A petition for the winding-up by the High Court of Justice was, on June 3, 1921, presented to the Court by Thomas Taylor, of Buxton Hydro, Buxton, Derby, a shareholder of the company, and will be heard before the Court sitting at the Royal Courts of Justice, Strand, London, on June 21, 1921. Vaudrey, Osborne & Mellor, 30, St. Ann Street, Manchester, Solicitors for the petitioner. NOTE.—Any person who intends to appear on the hearing of the petition must notify the above-named not later than 6 p.m., June 20, 1921.

Companies Winding Up Voluntarily

AMALGAMATED OILFIELDS OF TRINIDAD, LTD.—A meeting of creditors will be held at 13, Copthall Court, London, E.C.2, on June 21, at 12.15 p.m. Frederick Keer, Liquidator. NOTE.—This notice is purely formal, the liquidation being for the purpose of carrying out an amalgamation.

SAFETEE SOAP CO., LTD., Mr. Emile Scheitter, 3, Woodstock Street, Oxford Street, London, W., Liquidator.

TRANSVAAL HYDRAULIC POWER SYNDICATE (in voluntary liquidation).—A general meeting of members will be held at Bilbao House, 36-38, New Broad Street, London, E.C.2, on Monday, July 11, 1921, at 11.30 a.m. H. B. Browne, Liquidator.

Liquidators' Notices

THE SCIENTIFIC GLASS CO., LTD.—A general meeting of members will be held at the office of M. O. Heckels, Star Buildings, Northumberland Street, Newcastle-upon-Tyne, on Tuesday, July 19, at 9.30 a.m. T. E. Rowell, 33, Bedford Street, North Shields, Liquidator.

ODAMS NITRO PHOSPHATE & CHEMICAL CO., LTD. (in liquidation).—A general meeting of members will be held at the offices of Messrs. Viney, Price & Goodyear, 99, Cheapside, London, E.C.2, on Monday, July 11, 1921, at 2.30 p.m. F. B. Lacy and H. E. Sier, Joint Liquidators.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.*]

BRITISH OXYGEN CO., LTD., London, S.W.—Registered June 2, Trust Deed dated May 31, 1921, securing £250,000 debenture stock; charged on various properties in London, &c., also general charge. *£33,000. November 23, 1920.

DORMAN (W. H.) & CO., LTD., Stafford.—Registered June 6, £70,000 debenture stock, secured by Trust Deed dated May 20, 1921; charged on premises at Stafford, with fixed plant, machinery, &c., also general charge. *Nil. October 29, 1920.

EVANS, SONS, LESCHER & WEBB, LTD., Liverpool.—Registered May 31, assignment (supplemental to Trust Deed registered December 4, 1902, and a supplemental Deed registered March 12, 1908, securing £52,000 debenture stock); charged on premises at Liverpool; also registered June 1, £10,000 mortgage, to G. C. Nickels, Wolverton, Enfield and another; charged on 18 and 20, Seel Street, Liverpool. *£123,233. March 29, 1921.

WEBBS CRYSTAL GLASS CO., LTD., London, E.C.—Registered June 3, £25,000 (not ex.) mortgage, to Lloyds Bank, Ltd.; charged on Dennis Park Glass Works, Stourbridge, Medway Glass Works, Queenborough, and Royal Castle Glass Works, Hatton, Tutbury.

YORK GLASS CO., LTD.—Registered May 31, £45,000 debentures; general charge. *Nil. October 22, 1920.

Bill of Sale

[*The undermentioned information is from the Official Registry. It includes Bills of Sale registered under the Act of 1882 and under the Act of 1878. Both kinds require re-registration every five years. Up to the date the information was obtained it was registered as given below; but payment may have been made in some of the cases, although no notice had been entered on the Register.*]

MOTTERSHEAD, T.H., 80, Tootal Road, Weaste, chemical merchant. Filed June 10, £60.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

MATTHEWS, E.; Medical Hall, Royston, chemist, £10 13s. 8d. April 25.

CARLIQSO MANUFACTURING CO., LTD., 15, Wolstenholme Square, Liverpool, soap manufacturers, £13 2s. April 22.

DYESTUFFS, LTD., 4, Chorlton Street, Manchester, aniline dye makers, £23 2s. 5d. April 26.

EDWARDS, J. M., 311, Fulham Palace Road, London, chemist, £14 8s. 11d. April 28.

BLUNT, W. H. & SON, 69½ & 70, Snow Hill, Birmingham, druggists. £21 2s. 10. May 2.

The London Fire Brigade received an unusual call on Thursday, June 9, to King's College, Strand, W.C. On their arrival it was found that a portion of the buildings and one of the laboratories were full of fumes. Two firemen with special breathing apparatus went in and found that the cause was that a quantity of thermite had fallen into an earthenware sink. The firemen quickly dispersed the fumes.

Recent advices state that considerable quantities of German dyes are being exported to China and that the importation into Germany of Chinese products is again being actively resumed.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2 :—

ALBION PRODUCTS (1921), LIMITED, 11, Queen Victoria Street, E.C.4. Manufacturers of Electrochemical products and apparatus, and the manufacture of carbide of calcium. Nominal capital, £500 in 500 shares of £1 each. Directors : C. Bingham, C. H. Bingham, A. S. Young.

BRICOLIA, LIMITED, The Laboratories, Throwley Road, Sutton, Surrey. Chemical manufacturers, &c. Nominal capital, £105 in 105 shares of £1 each. Directors : H. C. Kennedy, B. C. N. Knight. Qualification of directors, one share.

GROWMORE FERTILISERS, LIMITED, Broadway Buildings, Station Road, Reading, Berks. Manufacturers, importers and exporters of natural and artificial fertilisers, &c. Nominal capital, £1,000 in 1,000 ordinary shares of £1 each. Directors : R. Jones, W. E. Parker. Qualification of directors, 100 shares.

HOOPER STORE CHEMISTS (LYNTON), LIMITED, Churchill, Lynton, North Devon. Chemists and druggists, &c. Nominal capital, £700 in 700 shares of £1 each. Directors : B. Hooper, T. Leeke. Qualification of directors, 10 shares.

SYDNEY HARVEY & COMPANY, LIMITED, 48, Mark Lane, E.C. Chemicals, &c., products merchants and brokers. Nominal capital, £50,000 in 50,000 shares of £1 each. Directors : H. Carter, H. C. W. Gibson. Qualification of directors, £1,000. Remuneration of directors, £1 1s. each meeting attended. Managing directors, £1,000.

UNITED GLASS BOTTLE MANUFACTURERS (CHARLTON), LIMITED, 40-43, Norfolk Street, Strand, W.C.2. Glass bottle manufacturers. Nominal capital, £1,000 in 1,000 shares of £1 each. Directors to be appointed by subscribers.

W. WINDLE & CO., LIMITED, 452, Edgware Road, W.2. Chemists and Druggists. Nominal capital, £500 in 500 shares of £1 each. Directors : To be appointed by subscribers. Qualification of directors, one share. Subscribers : G. W. Knight, M. R. Knight.

British Laboratory Chemicals

PROFESSOR J. R. Partington and Mr. C. L. Bryant announce that the question of the quality, supply and prices of British laboratory glassware, porcelain and chemicals, including research chemicals, is under consideration by a committee of the British Science Guild. The committee, the chairman of which is Sir Richard Gregory, is anxious, in view of the conflicting statements which have appeared from time to time on these matters, to obtain the views of scientific workers who have experience of recent articles of the kind described, both of British and foreign manufacture. It is obvious that the information can be of use only when it applies to goods of definitely known origin. The points on which information is desired are : The quality of the goods ; their price as compared with that of imported articles of the same quality ; the facilities for obtaining supplies ; and the effects, if any, on research work of restrictions imposed on the importation of German goods. The committee would also welcome statements made, or reasoned conclusions arrived at, by competent bodies who have investigated these questions recently, and from manufacturers who wish to add any further definite information to that which has already appeared in the Press. The information should be sent to the secretaries of the committee, Prof. J. R. Partington, East London College, or Mr. C. L. Bryant, 23, Peterborough Road, Harrow, as soon as possible.

South African Chemical Industries

THE following are among the new industries which have been established in South Africa during the last few years : Amonia, asbestos-cement, patent fuel, cream of tartar, rubber manufactures, and tartaric acid. In the near future the manufacture of white lead will be undertaken.